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Sophia Howard

GALE's

RECREATIONS.

GALE'S

CABINET OF KNOWLEDGE;

OR MISCELLANEOUS

RECREATIONS:

CONTAINING

MORAL AND PHILOSOPHICAL ESSAYS, PROPOSITIONS,
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APPENDIX;
CONTAINING VARIOUS PROPOSITIONS TENDING TO PROVE
LIGHT AND HEAT TWO DISTINCT BEINGS;
With some curious DEFINITIONS in OPTICS.

THIRD EDITION,
WITH MANY VALUABLE ADDITIONS.

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M,DCCC.

RECREATIONS:

CABINET OF KNOWLEDGE:

THE PREFACE.

THE Title-page ſetting forth ſo fully the ſubſtance of this Book, it is preſumed that little need be ſaid in reſpect to its contents; yet, as a preface is uſually expected, I cannot well avoid ſaying ſomething relative to its utility.

The following Sheets will be found to contain ſuch a Collection of choice, uſeful, and entertaining Matter as never before appeared in print; and ſuch as muſt prove a ſpring of invention to the ingenious reader: furniſhing him with ſuch hints, contrivances, and diſcoveries, as are ſerviceable to the neceſſity, convenience, and pleaſure of human life. Of all the methods capable of being practiſed with ſucceſs, for cultivating the underſtanding, there are none that procure more ſure and laſting effects than curioſity.

The deſire of wiſdom and knowledge to us is as natural as reaſon, it exerts itſelf with force and vivacity through every ſtage of life; but never with more efficacy than in youth,—when the mind being

being unfurniſhed with knowledge, ſeizes with a peculiar eagerneſs on every object that is preſented to it; reſigns itſelf to the charms of novelty, and eaſily contracts the habit of reflection and attentiveneſs.

We might receive all the Benefit this happy diſpoſition is able to produce, did we employ our time upon ſubjects equally fit to engage the mind by pleaſure, and fill it with clear and inſtructive ideas.

It is by this Book that I propoſe to lay open to every eye ſuch entertaining extracts as muſt tend to make young perſons ſenſible of what treaſures they poſſeſs unenjoyed—and to preſent to their obſervation, thoſe things which inat-

tention, want of time and opportunity, might have concealed from them.

But as it is not ſufficient to give the mind a propenſity to be curious, by entertaining it with agreeable ſubjects, unleſs we likewiſe teach it to be moderate and cautious in its curioſity, my intention has been not ſo much to collect all the deep learning that may be advanced under each particular, but to offer that which ſeems, in my judgment, moſt eaſily to preſent itſelf to the firſt efforts of reaſon; and to be moſt adapted to the taſte and occaſions of thoſe readers, whom I had principally in view.

As to the mode of the work, I have endeavoured to exclude from it whatever might

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The following is an improved Anſwer to a Query inſerted in Page 255 of this Work.

Query.

GREAT BRITAIN was diſcovered to be an Iſland in the Year 70——Who was the Diſcoverer?

Anſwer.

JULIUS AGRICOLA, who governed Britain in the reigns of Veſpaſian, Titus, and Domitian, who alſo was the Perſon that finally ſubdued the Britons, and traverſing the whole Iſland, introduced the Roman laws and civility, and incorporated them into the empire of their conquerors.

might ſeem diſagreeable; and inſtead of a methodical diſcourſe, or chain of diſſertations, that frequently ſatiate and diſguſt, I have choſen the ſtile moſt natural and proper to engage all ſorts of readers.

The works to which I have had recourſe, for my own information, and to juſtify my remarks, are ſuch, I have no doubt, as will meet the good opinion and approbation of my readers; ſuffice it to ſay, that they are ſcarce, and not to be found in every library.

The alterations I have made to the matter extracted, are of two kinds, ſome only relate to a few expreſſions that ſeemed too negligently touched, while others

regard

regard the ſubſtance of things, which in ſome places it was neceſſary to illuſtrate, and in others to entirely reform; and upon the whole no pains have been ſpared to render this work valuable, and worthy of attention.

J. GALE.

LONDON.
1799.

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THE

GALE's

CABINET OF KNOWLEDGE;

OR,

MISCELLANEOUS RECREATIONS.

PART I.

TRUTH's MORAL EUCLID.

TRUTH in general is, *what is*; And what is, *is* but in respect of being *conſciouſly* perceived by *ſome* Being: For if there was *no* Being to perceive what *is*, nothing could exiſt, ſince abſolute *imperception* implies abſolute *Non-exiſtence*. Hence all *truth*, is relative, or refers to other *truth*, *ad infinitum*, 'till we ſtop at ſome original; which proves the neceſſary and abſolute exiſtence of a *God*; an adorable *Great Being*; to which all other things, or Beings neceſſarily refer: whoſe own abſolute *perfections* refer to his own abſolute immenſity, in which all things are relatively ſubſiſting and have their being. But how, or in what manner this infinite and aſtoniſhing *Chain* of exiſtence depends, our capacities are ignorant, except in ſome very few particulars, conſiſtent with the nature of our preſent Being. And though the *Ways* of this *Great Being* are unſearchable, and his *Wonders* will be ever paſt finding out, all intelligent Beings can diſcern ſo much of his perfections, by referring to their own conſcious perception (the next truth lying open) as at once command

their profound adoration! And men, and all beings, may be juſtly looked upon as a part connected with the great whole, which though inconſiderable in reſpect of that immenſity, yet for wiſe cauſes cannot be deſtroyed; whatever *changes* all beings (animate or inanimate) are appointed to undergo. And as the *Law of God* is written in every man's heart; or *conſciouſneſs* (which he cannot recede from, or find *plea* to evade) he is relatively accountable for what he does in reſpect of his great original, and the *beings* with which he is immediately connected; and therefore this *ſtandard of conſciouſneſs* in man, beyond diſpute, is the *truth*, to which all his actions muſt refer: and even his *volition*, or will, according as he is *conſcious* of his *intention* of *good* or *evil*, and no farther. And for any man to aſſert that he is not *free*, (notwithſtanding his connexion with other parts of the univerſe by which he may be relatively influenced) is the ſame in truth, as if he were to aſſert that he did not exiſt, when his *conſciouſneſs* is a proof of it to himſelf, and his very *denial* of his exiſtence, a proof of it to the *conſciouſneſs* of others. So likewiſe he that denies the exiſtence of a God, denies his own *exiſtence*. If truth could be ſet aſide or baffled, as eaſy as it is denied by *ſceptics* (who ſometimes diſallow the Freedom of Human Actions) Human Laws would be in vain! and the judge, who ſhould, at laſt, aſk the Priſoner *guilty* or not *guilty*, in order to prove the truth; would himſelf be found guilty of a *falſe maxim!* When men deny the conſcience and ſenſe of things, all argument drops, and there is an end to enquiry after truth, by relation or connexion of propoſitions.

Having cleared the way to truth, (which variouſly refers) we would eſtabliſh ſome general maxims (referring to the ſtandard of conſcientious right and wrong) as rules for Happineſs in the conduct of human Life. And herein we are obliged to the learned *wiſe* and juſt *maxims* of the ancients.

True Moral Maxims.

1. The end of man's exiſtence is propoſed for happineſs.

2. General happineſs ſhould be propoſed in the private, and in reſpect of Society.

3. Men ſhould not do unto others what they would not be done unto, in reſpect of conſcientious right and wrong.

4. Virtues and vices in men's power, make rewards and puniſhments neceſſary, in reſpect of ſociety.

In

5. In ſome caſes mercy is better than juſtice, in reſpect of ſociety.
6. God is ſeen in all his works.
7. God is adorable for his perfections, *&c.*

PROPOSITIONS.

1. Virtue promotes happineſs, private and public.
2. Vice is deſtructive of happineſs, private and public.
3. Honour is the reward of virtue.
4. Fawn not on a *prince*, nor trample a *beggar* under foot; *&c.*

By which it will be ſeen how far *morality* is capable of demonſtration, according to the opinion of Mr. *Lock*, in his Eſſay on *Human Underſtanding*, that it is; by an induction of moral propoſitions or precepts, in the ſolution of any moral difficulty, or problem.

PROPOSITION I.

Virtue promotes happineſs, private and public.

DEFINITION and DEMONSTRATION.

As in our *introduction* concerning truth, we have proved, that every *thing* known by the human mind, is but by its *reference* to, or *compariſon* with other things, according to *conſcious perception*; and that nothing is abſolute but God; ſo virtue refers to human *action*, or diſpoſition of mind, and the *compariſon* of each with one another.

VIRTUE is the *name* of ſuch *moral* actions, and *diſpoſition* of mind, wherein the *benefit* of human ſociety, in general, is *conſciouſly* intended. If the *benefit* is reſtrained to *particular* perſons, at the expence of *injury* to others, it is not *moral* public good; which likewiſe regards the end of ſociety linked in government. What promotes *moral* public good among the *whole*, and in each *particular* promotes happineſs, private and public; which is *virtue*. *Q. E. D.*

Corollary.

HENCE, to act according to *virtue*, is to act conſiſtently with the *harmony* and benefit of the *whole*, and of each *particular* member of ſociety; which is the ſame as to act according to reaſon, judgment, and morality.

Proposition II.

Vice is destructive of happiness, private and public.

Definition and Demonstration.

Vice being the *contrast*, or *opposite* to virtue, refers likewise to action, and disposition of mind, wherein *selfish* gratification, and *private* ends are considered, or *consciously* intended to the hurt of particular persons, against the *benefit* of society. If the ends intended by action, and disposition of mind, were for *moral* public good, they would not come under the denomination of vice; but those ends are sometimes perverted, and intended for public *mischief*, in the gratification of private ambition, spleen, or resentment, which is *vice* of the deepest dye: *As witness rebellions in Heaven, and on earth.* Yet they always tend to destroy the peace and welfare of *particulars*, and therein are destructive of that *harmony*, which should subsist in the *whole*; consequently are destructive of happiness, private and public. *Q. E. D.*

Corollary.

Hence, to act according to *vice*, is to act inconsistently with the harmony of the *whole*, and of each particular *member* of society; which is to act according to *madness*, *folly* and *immorality*.

Scholium.

The degrees of *virtue and vice*, are according to the degrees of the good and ill intention with which they are practised.

Ill consequences may ensue from *good* design, and *good* effects from *ill* purposes, as matters of *slight* or little consequence may proceed from either; which alter not the *merit* or *demerit* of the motive they proceed from. So likewise, *consciousness* of right and wrong, each person's director, is the measure of *innocence*, where neither *good* nor *ill* is intended; as it is the measure of every *duty* and *omission* in human life.

As men are linked in society, under the particular forms of government, and each member's time part of the public treasure, they are bound by their obligations to God for their Being, and the *whole community* for protection, *to bear and forbear*, with one another, as much as possible, consistent with their respective happiness, and the public emolument; according to the maxim

of *Epictetus*. But diſcovering men of *treacherous* diſpoſitions, we may ſafely be allowed to break off farther ſociety with them; as with the feweſt acquaintance there is the leaſt hazard of diſagreement. And men of the aforeſaid diſpoſitions may be looked upon as pernicious members of ſociety, by whatſoever *veil* they appear with *fair* characters. As it is incumbent on every *member* of ſociety, by nature and reaſon, to promote his neighbour's welfare and happineſs, ſo far as is conſiſtent with his *own*, and the happineſs of the *whole*; ſo is it againſt nature and reaſon, for the *whole*, or any particular *number of members* thereof, more or leſs, to diminiſh the welfare or happineſs of any *particular*, or *particulars*, belonging to that ſociety; the *obligations* betwixt *each* and the *whole* being mutual and reciprocal. Yet, where men *wilfully* counterplot each other's happineſs, for private *lucre*, and ambitious views to themſelves, the *ſatiriſt* is at liberty, with a *moral* view, to uſe methods for reclaiming them, and for reſtoring the benevolence of ſociety. There are many other *unworthy* members of ſociety, whoſe *vices* are all proper objects of the *ſatiriſt's* ridicule.

The preceding *propoſitions* proved true, being the two *principal* ones in the doctrine of *morality*, ſerving, like 47 *E.* 1, and 4 *E.* 6. in *geometry*, the demonſtration of many other *propoſitions* may be deduced therefrom, and the axioms of *conſcientious* right and wrong, and of doing as we would be done by; which axioms are often forgot, or neglected.

Proposition III.

Honour is the reward of virtue.

The Demonstration.

Is very plain from the foregoing *inductions*; for virtue being *benevolent* to *all*, muſt needs be applauded and rewarded by *many*; bringing reputation and honour. *Q. E. D.*

Proposition IV.

Fawn not on a Prince, nor trample a beggar under foot.

Demonstration.

To *fawn*, is to ſuffer one's ſelf to be *trod under foot*, by courting the *inſolence* of mankind. By which ſervility many have paved

their way with difficulties, who might have gone *smooth* and eaſy; which was therefore acting *not right*. And to treat a beggar as we would not be treated ourſelves, by treading him under foot, is acting againſt *conſcience*, and therefore wrong. *Q. E. D.*

We now proceed to lay down ſuch *moral propoſitions* and *rules* of happineſs in the conduct of human life, as occur to our preſent perception; leaving the *demonſtration* thereof to be examined hereafter, as we ſhall find occaſion, in ſolving *moral* problems relating to right and wrong *practices* of mankind: wherein we propoſe to make diſcoveries in the crooked, and by-ways of human action, ſhewing, by inveſtigation, how to *ſquare* and *rectify* the ſame.

Moral PROPOSITIONS, RULES, *&c.*

1. To avoid *ill* Thoughts, is to be habituated and employed in *good* ones.

2. Converſation with *wiſe* men delights and inſpires us with *noble* ſentiments.

3. *Evil* communication corrupts good *Manners*; or, ill or fooliſh company communicate their contagion.

4. ALEXANDER the Great learned his *drunkenneſs*, by aſſociating with *Leonides*; and NERO, his *cruelty*, of his barber.

5. *Idle* jeſts, in converſation, are the *ſquibs* of wit; and vain compliments, verbal *idolatry*.

6. Make no *figure* among *cyphers*.

7. In the reputation of being *witty*, is commonly loſt the reputation of being *wiſe*.

8. To ſtudy *nature*, is to read the volumes of the *univerſe*, lying open to *all*, but regarded by *few*.

9. Chuſe your *books*, as you do your *friends*.

10. *Antiſthenes* uſed to ſay, that *learning* was good *company*.

11. Shun *ill* manners, wherever you *meet* them.

12. By *much* familiarity *eſteem* is loſt.

13. If any *ſlanders* you, obſerve to him, that he knows not your other *faults*, becauſe if he had, he would have mentioned them.

14. Always *reprove the vice*, but not *reproach the perſon*.

15. Virtue procures and ſecures friends.

16. Be thou *bonorum maximus, & magnorum optimus*.

17. *AS all men deſire happineſs, each member of ſociety* ſhould promote the happineſs of his *fellow being*, but always conſiſtently with

with *justice* to himself, and the public community, *i. e. for all men to do as they would be done by.*

18. *Self-love*, which is implanted in us to serve ourselves, should teach us, by our own wants, to serve others.

19. *Benefits* received lay us under proportionable obligations to our *benefactors.*

20. *Injuries* done to private persons sometimes are better resented with *forgiveness* than justice, in respect of the forgiver's happiness consequent thereto.

21. To forgive private injuries and affronts, or to return them with kindness and civilities, *shames* the offender, and may work better effect than exacting justice.

22. *General* Satire and moderate justice restore the benevolence of society, while *personal* reflection, and *persecution*, stir up endless hatred and malice.

23. If man is not a free agent, as some *sceptics* assert, he has no cause to complain of injuries received, or of what others can bring upon him.

24. If man is a free agent, as his consciousness suggests to him, he is worthy of rewards or punishments, or of the favour or disesteem of others, according as he promotes or destroys the happiness of his *fellow beings*, with whom he is linked a member of society, by the nature of government.

25. The only proof of the *freedom* and *power* of the human WILL is man's consciousness of them.

26. The greatest *virtue* that can be acquired is the *habit* of doing good.

27. The greatest *vice* that can be attained is the *habit* of doing evil.

28. Neglecting to do good, when we have it in our power, without doing injury to ourselves, or others, is a prostitution of our abilities.

29. To destroy public happiness is the grand quality of the *Devil.*

30. To promote public happiness is a *kingly* virtue.

31. The *passions*, which are the principal motives of action, serve to exercise our *reason*, which, by comparing consequences, regulates our conduct.

32. The *passions* and *reason* are rightly proportioned; though the former become predominant by habit.

33. Religious faith agreeing with *morality*, refines the affections, and fills the mind with serenity and composure.

34. *Hope*,

34. *Hope*, by religious faith, if grounded on morality, exalts the mind to greater happineſs than acts of virtue can do, without faith: becauſe men may be ſtrictly *moral*, but, wanting religion, can build no hopes on the reward of their virtue, from the SUPREME BEING.

35. The *rational* cuſtoms of religious worſhip, void of ſuperſtition, exalt our thoughts to magnanimity and virtue.

36. Religion, morality, and happineſs, conſequent thereto, are promoted by frequent attention to thoſe two ſubjects.

37. Irreligion, immorality, and miſery, are encreaſed by a familiarity with the monſtrous productions of hell in human ſhape.

38. Offences and injuries received ſhould be treated with *charity* or *juſtice*; but not with malice or revenge.

39. *He* that is guilty of *lying* or *deceit*, is incapable of friendſhip with all *honeſt* men; becauſe he cannot be depended upon.

40. He that advances a wilful falſehood of another in public, by making a falſe quotation, or tranſlation (as *Lauder* did of *Milton*) is as great a *criminal* as a falſe evidence at the bar of a court of juſtice, where matter of property is concerned; becauſe he is equally audacious, and guilty of ill deſign.

41. Criticiſm is no crime, except attended with *evil* intention, and *wilful* miſrepreſentation.

42. He that accuſes another of evil, and evil deſigns, and cannot prove his aſſertions, deſerves the puniſhment due to that evil he would make another guilty of.

43. Avarice of *fame* is attended with numerous evils.

44. The ſureſt way to *fame* of any kind, is by indifference about it, while the *purſuit* is ſome public good.

Vice is a monſter of ſo frightful mien,
As to be hated, needs but to be ſeen;
But ſeen too oft, familiar with her face,
We firſt endure, then pity, then embrace.

POPE's *Ethics*.

Corollary.

HENCE religion, *(not founded on ſuperſtition)* and morality, are found mutual friends to each other. Religion cannot ſubſiſt without morality; and morality without religion, is like a traveller, paſſing, by himſelf, over a deſert country, and loſing his way.

FROM

FROM *prop.* 33, 34, 35, 36, (all proved true by a ſhort induction) appears the *great uſe* of ſetting one day apart in ſeven for divine contemplation and worſhip, according to the cuſtom of all wiſe nations, adoring their *creator* on the *ſabbath*. By which religious application, Mr. *Pope's* maſter-paſſion, and train of leſſer *ſerpents*, lamented in *Ethic Epiſt.* II. V. 101. to V. 150, can be only ſubdued.

Scholium.

To thoſe, who may aſk what is the importance of the many *trifling actions* of mankind, to an INFINITE BEING during their continuance upon this earthly ſpot, Mr. *Addiſon* obſerves, that the happineſs of a future life is the natural reſult of good habits acquired in this, and not of any merit in us for ſuch a ſtate, except by thoſe habits. Man firſt loſt his happineſs by an *act of diſobedience* to his maker, if original tradition may be credited; and if he continues to follow the corruptions of his nature from his evil choice, *mercy*, tho' infinite, is ſuppoſed to avail him nothing. Though *man* is ſo limited in his bodily capacity, as to appear of little more conſideration than a *mite* in the *univerſal eye*, ſurveying all nature, yet by his intellectual conſciouſneſs, foreſight, and boundleſs contemplation, partaking of the divine nature, his emulation for the higheſt atchievements, and his deſire of immortality, he ſeems to be deſigned by his maker for no leſs honour than an *Abidel*, *Raphael*, or *Michael*, deſcribed by *Milton* in his *Paradiſe Loſt*.

MORAL OBSERVATIONS.

1. "Men who will not take warning, will not take advice."

2. *Spleen*, *impudence*, and *ill-manners*, are immorally uſed, and too often miſtaken for *wit*.

3. If you ſeek *peace*, avoid the immoral and vain.

4. "Ill company is like a *dog*, who fouls thoſe moſt whom he loves beſt."

5. Truſt not treachery a ſecond time.

6. "A nice man is a man of naſty ideas."

7. *Formality* is no token of friendſhip.

8. Many people take more care to hide their wiſdom, than their *folly*.

9. Affectation

9. Affectation is the *ape* of ſenſe and polite breeding; *i. e.* the ape of dignity.

10. The *inquiſitive* man is a dangerous acquaintance.

11. Popular pageantry is the *fop's* happineſs.

12. Health, peace, and ſufficiency, conſtitute the happineſs of a *wiſe man*.

13. *Marriages* will be more happy, when the *married* are more diſcreet.

14. *Drunkenneſs*, *gaming*, *riot*, and *exceſs*, are the faſhionable arts of this age.

15. *Science* and *literary* improvements are as much neglected, as they were in the declining ſtate of the *Roman* empire.

16. With all our religion, we fall greatly ſhort of the *Roman* virtues.

17. If religion is *hypocriſy*, *virtue* is turned out of doors.

18. Oh! the vaſt fountains of happineſs that are ſhut up and reſtrained.

19. If each qualified perſon endeavoured to promote the happineſs and welfare of individuals (*like the late Duke of* Richmond, *of glorious memory*) what bleſſings would ſoon flow over this land!

20. Shall any neighbouring nation pretend to rival *Britain*, in *wiſdom*, *proweſs*, *virtue*, *learning*, and *beneficence*?

21. If ſome had the power to promote *public good*, as they wiſh it, how happy would this nation be!

22. *Exemplary practices* among the *great*, have the moſt influencing effect upon the human mind, whether *good* or *bad*. If *good*, the ſcheme propoſed by the late *celebrated Dean Swift*, for the advancement of *religion* and *virtue*, is certainly the beſt that can be thought of.

23. How would it redound to the glory of this nation, and the good of poſterity, to ſee it recorded in *hiſtory*, that in ſuch a *century* by the united force of men in power, vice and immorality in *England* received a deadly blow, and the *Britiſh diadem* a jewel of ineſtimable value!

24. ALL *controverſial* argument convinces ſo much the more, the more it is moral, and free from ill manners.

25. *Abuſe* in argument to prove *truth*, is juſt like *ſwearing* in converſation, to prove *courage*.

26. Moral *ridicule* or *raillery*, in public argument, ſerves to rouſe the attention of the *reſpondent*, and *hearers*, alſo to laſh *public infamy*, with the ſatirical juſtice due to it; but, in perſonal diſputes

putes about knowledge, and the fame of it, ridicule and raillery, confined to decency, ſerve to aſſert underſtanding, and ſilence and abaſh the obſtinate in error.

27. The *paſſions (more ſtrong in ſome than others)* are apt to be inflamed on any real or fancied injury received, and the force of reaſon can hardly reſtrain them; yet the *will*, as preſident, and the *rational powers* being ſummoned to council, the *paſſions*, thereon become obedient, and ſubmit to order.

28. While there is *evil* in the world, men will ſtill be infringing upon each other: the *evil* firſt brought in, and ſtill ſubſiſting among mankind, being the *cauſe* of all the misfortune and miſery attending their being.

29. *Evil* is ſo habitually planted in ſome natures, it is not in the power of friends to promote ſome men's happineſs, while *(like common proſtitutes)* they are ſtill ſeeking misfortune, and bringing it down upon their own heads!

30. Abandoned *hackney writers* complain of their cruel treatment from bookſellers, to whom their ill morals have juſtly rendered them a prey: like *proſtitutes* for pay, that will oblige and p--x their benefactors at the ſame time.

31. "*The ſerpent loſeth not his ſting, though benumbed with the "froſt: the tooth of the viper is not broken, though the cold clo-"ſeth his mouth: take pity on his ſtate, and he will ſhew thee his "ſpirits: warm him in thy boſom, and he will requite thee with "death.*"

32. *Genius* may be admired in any, but ill morals muſt be hated in all.

33. It is no charity to aſſiſt a *proſtitute* loſt to all ſhame, and abandoned to miſery of his or *her* own ſeeking.

34. He that chooſeth a *beaſt* able to bear his burthen ſhall find reſt; but he that carries a *Vulture* upon his ſhoulders ſhall be pulled to pieces, and die, as he lives, miſerable.

35. Dirt thrown at a clear character will not ſtick.

36. The heart of the hypocrite is hidden in his boſom, and his buſineſs is to deceive.

37. He works in the dark like a mole, and fancies himſelf ſafe; but blunders into day-light, and is betrayed and expoſed, with his dirt in his hand.

38. His days are a perpetual conſtraint upon him, and his tongue and his heart are for ever at variance.

OF

OF TIME.

TIME, by it's nature, proceeds with a conſtant and equable flux, and therein differs from *duration*, which is permanent and ſtable. The meaſure of *Time* muſt therefore be referred to *motion*, of ſome kind or other: That of the heavenly bodies has, by the univerſal conſent of all Ages, been made choice of for this purpoſe; eſpecially the *Sun* and *Moon*, which ſeem to have been intended, beſides their other uſes, for perpetual *chronometers* by the divine architect himſelf; namely, to diſtinguiſh, and mark out, *ſeaſons*, *days*, and *years*.

Relative reſt we obſerve daily in the maſſes of lifeleſs matter about us; but abſolute reſt in any thing in infinite ſpace, is as hard to be aſſigned, as the place of an abſolute *vacuum*, or ſpace void of all ſubſtance whatſoever.

Though the earth's motion from weſt to eaſt, contrary to the ſun's apparent one from E. to W. is doubtleſs the truth; yet ſome have queſtioned, whether the ſun has only a diurnal rotary motion in the ſame ſpace, or may be relatively moving contrary to the earth, and other planets, at the ſame time, by which the *direct*, *retrograde*, and *ſtationary* appearances of the neighbouring globes, may without the uſual principles be accounted for (to the greater *wiſdom* and glory of the *divine architect!*) with all the ſhining hoſt of innumerable worlds attending: not ſuppoſing the ſun to move at ſo vaſt a diſtance, as we now ſuppoſe, in completing the annual period.

Aſtronomers obſerve that days, hours, and minutes are reſpectively unequal, occaſioned by the earth ſlackening her pace, and ſometimes quickening it again, in her orbit. This they infer from the ſun's different apparent Motion. Therefore to meaſure time, or refer it to a ſtandard of uniform motion, they have fix'd the length of the tropical or ſolar year (or that time wherein the ſun and earth finiſh all their poſitions in reſpect of each other) to the exact period of $365^d\ 5^h\ 48'\ 57''\ 39'''$, &c. which however, is no more certain, than the mean length of a day: Since, in this computation, they divide the diſtance of time betwixt any two diſtant *Æquinoxes* obſerved, by the number of revolutions happening between, for the length of this ſuppoſed permanent *ſolar*-period. And I have obſerved, that Sir *Iſaac Newton* went no farther back than 20 Years betwixt the two obſervations, which could not bring the meaſure of

the

the year to ſo great an exactneſs, as if he had gone as far back as the fartheſt true obſervation that has been made, of the ſun's arrival at any point of the ecliptic, and ſo dividing the whole time elapſed by the remoteſt obſervation, whether of *Ptolemy*, or before. The *mean tropical year* this way determined, would have rendered it near the truth, if there had been an error of an *hour* or more in the firſt obſervation; becauſe the error would have been divided into ſo many parts by the number of revolutions as to become of inſignificant value in one ſingle revolution, or year.

Hence $365^d\ 24233402\overset{dec}{7}$: 365^d : 12^s : $11^s.\ 99203814$, *&c.* $= 11°\ 29'\ 45'\ 40''\ 7'''$, *&c.* the mean diſtance moved over by the ſun in a common year: According to which the mean diurnal motion in the ecliptic $= 59'\ 8''$, *&c.* whereas the apparent or real motion amounts to $61'$ ſometimes, but at other times ſcarcely to $57''$. And the *mean* and *true times* are ever proportional to the *mean* and *true motions*.

But, conſidering the annual motion of the equinoctial points in *antecedentia*, reckoned at the mean rate of $50''$ by ſome (but differently by others) the variation of the *ecliptic*'s obliquity, the different diſtances of obſerved *Equinoxes*, for determining the length of the *ſolar*-period, an uncertain length of the year muſt thence ariſe: Whence it follows, that all aſtronomical tables, built on this or that particular length of years, muſt vary more or leſs from truth, in computing by them, according as the preceſſion admitted, length of the year, excentricity of the earth's orbit, *ecliptic*'s obliquity, and the mean and true motion therefrom, variouſly meaſured. Computations by each of theſe tables will agree with obſervations neareſt the time when the tables were made, except when errors of one kind compenſate for thoſe of another. Mr. *Street's Aſtronomia Carolina* Tables, once in great repute for their exact uſe in computing the places of the *celeſtials*, are ſince exceeded by Mr. *Flamſteed*'s ſolar numbers, as Mr. *Flamſteed*'s will very likely be exceeded by Dr. *Halley*'s, and as Dr. *Halley*'s tables will, very likely, be exceeded by others of a ſtill newer improvement. Aſtronomical inſtruments, exacter than thoſe uſed by Mr. *Flamſteed*, in Sir *Iſaac Newton*'s time, or Dr. *Halley*'s ſince, are now moſt commended, and there is no fault now in the eye of an obſerver. And the ſet of motions which have been deduced from a ſet of obſervations (foreign and domeſtic) muſt yield to the next more faſhionable. Sir *Iſaac Newton*'s theory of the moon, at firſt ſo much applauded, has ſince, by infallible obſervation, been diſcovered to be im-

perfect. Which is alſo evinced by the reformers of gravity among the *Celeſtial* bodies, like the *Corpuſcularians*, in the *practice* of phyſic.

ANOTHER gentleman (more indefatigable than any of his predeceſſors) has diſcovered the *aberration* of the fixed Stars from the motion of light and of the earth in it's orbit; and has made a curious and unexpected diſcovery (in a letter to the Right Honourable the Earl of *Macclesfield*) of a new motion among the fixed Stars. And worlds, or diſtant ſyſtems, may (probably) have a relative motion among one another, at the ſame time that they are relatively moving on in the infinite ſpace. The notion of a plurality of worlds has prevailed ever ſince the time of the *Pythagoreans*, who maintained (as we now do) the probability of the planets being inhabited, and kept in their *orbits* by natural gravity; each moving like a ſtone whirled round in a ſling, by *centripetal* and *centrifugal* forces. *Lucretius*, taught by *Epicurus* and *Democritus*, ſuppoſed worlds without number poſſeſſing infinite ſpace, and counterpoiſing each other by ſome general law of gravitation; and that if bodies were bounded, thoſe within the limit would, by the attraction of one another, in time unite in the middle ſpace. And herein it is obſervable, that *limits* of ſpace appear as impoſſible (to conception) as limits of time, or of exiſtence; ſince there is no thought can imagine when *time* and *exiſtence* were not; nor can imagination repreſent a poſſibility when time and exiſtence ſhall be no more: Therefore an *eternal exiſtence* is neceſſary and abſolute. But the infinite ſucceſſion of time, and thoſe points of it from whence all new exiſtence, of ſubſtantial forms, or a change of things exiſting immediately ſpring, and receive their aſtoniſhing modes of alteration, who but an *infinitely great, omnipotent, and omnipreſent, Being*, can comprehend?

I can't tell how or why I came to be,
Why not before, what mortal yet cou'd ſee,
I know I am, and that's enough for me.
Exiſting nature too I can diſcern,
And wiſdom infinite from thence I learn:
Effects and cauſes mutually depending,
From infinite to infinite extending.
Sceptics, and critics, by your learned leave,
Conſcious perception can't the ſenſe deceive.

Pythagoras

Pythagoras obſerving the different ſound of hammers upon a Smith's *anvil*, diſcovered the harmony of muſic by weights ſuſpended at the ends of muſical chords equally thick, generating tones: which weights he found were to one another in a reciprocal proportion of the ſquares of the length of the chords of equal tenſion, and producing the ſame ſound reſpectively. He thence applied this harmony between weights and their diſtances of ſuſpenſion to the *celeſtial* bodies moving, at certain diſtances, about their centres of motion, (called the harmony of the ſpheres) proportioning the gravity, weight, or tenſion of each planet, towards the Sun *reciprocally, as the ſquares of their reſpective diſtances*, which aſtronomers have not gone beyond to this day.

THE ancient *aſtronomers* firſt imagined, that the *celeſtial* bodies had a circular and equal motion round the body which they ſuppoſed at reſt, but not finding this *circular hypotheſis* to agree with their obſervation (the Sun ſpending near eight days more in the northern, than in the ſouthern ſemi-circle of ecliptic) to reconcile appearance better to ſuppoſition, fixed the earth (or Sun) at reſt. 3450 ſuch parts from the centre of the ſuppoſed circular orbit, as the radius of it is 100000, which diſtance from the centre is called *eccentricity*, whence they readily calculated the Sun's place at any time. Though this *theory* anſwered pretty well for the place of the Sun, the motion of other planets could not be accounted for by it: therefore it was changed by *Kepler*, for the elliptical theory; which ſuppoſes the Sun, in the lower *focus* common to the elliptical orbits of all the planets, with a rotary motion only about his own *axis*, they circulating round him, and deſcribing conſtantly *equal areas in equal times (or areas proportional to the times) by rays drawn from the Sun, to each reſpective planet.* By the ſame hypotheſis are repreſented the motions of all the ſecondary planets round their primary ones, placed in the *focus* of each ſecondary's orbit: and this *hypotheſis* anſwers to the appearances in the heavens beyond all others hitherto invented; though *Kepler* himſelf at firſt doubted whether ſome *orbits* vary from true *Ellipſes*; thinking it not improbable, that ſome might have a form like the ſection of an *egg*, by the force of gravity dilating one part of the orbit more than another. But this theory is not to be conſidered as truth, but a method of adapting rules to appearances: It is but following the track of the firſt circular theory, which ſuppoſed the earth (or Sun) at reſt in the centre of the planetary orbits, and planets moving circularly

round them, which muſt then deſcribe equal areas in equal times, as is now ſuppoſed in the elliptical *theory*.

THE Sun's *leaſt* apparent diameter in *apoge* has been accurately obſerved 31′ 29″, and his greateſt in *perige* 32′ 33″, by which it ſhould reſult, that the Sun's greateſt and leaſt diſtances are as 1953 to 1889, as 101661 to 98339 (*vid. Keil's Aſtron. p.* 276) and the eccentricity only 1661 of ſuch parts, as the radius of the *circular* orbit, ſem. trans. (or mean diſt.) of the elliptical one is 100000: But the ancient eccentricity 3450 is above double 1661, from whence the *circular theory* is concluded to be falſe. For, admitting but 1725 one half of the ancient eccentricity, it would better agree with the Sun's apparent diameters obſerved: but then would not, ſo well as the *whole*, account for the appearances of the Sun's unequal motion round the year. And making (as the *ancients* did) the centre of the circular orbit, the centre of equal motion, 1725 eccentricity, will not account for the *annual* inequalities: for the *proſtaphæreſes*, or differences between the Sun's mean and true places are thus twice as much as they will amount to with this half of ancient eccentricity. This *defect* of ancient *eccentricity* of the circular orbit was afterwards remedied, by placing half of it each way from the *orbit*'s centre, and making the centre of equal motion at the contrary extreme to that where the earth or Sun is placed, which in the elliptical orbit is ſuppoſed, by *Ward* and *Bullialdus*, ſimilar to the centre of equal motion in the circular theory. Mr. *Street*'s eccentricity to the preſent *theory* of the earth's motion is 1732, and Mr. *Flamſteed*'s 1692, which make a difference in finding the Sun's true place from his *mean*; nor is this difference likely to be adjuſted, while ſo many *obſervators* of the *celeſtials* are, like ſo many *ſurveyors* of a gentleman's eſtate, differing in their quantities from one another.

IT has been obſerved by *Kepler*, that the *ſquares of the periodical times of revolving bodies, are as the cubes of the diſtances from the centres of the orbits, about which they are ſuppoſed to perform their equal motions*: i. e. *as the cubes of their mean diſtances from the body about which they revolve*. And this univerſal theory of motion, examined and confirmed by Sir *Iſaac Newton*, is ſaid to be only contradicted by ſuppoſing the Sun in motion, and the earth at reſt.

THE

THE THEORY OF MOTION OF THE CELESTIAL BODIES, IN OUR SYSTEM.

MERCURY, *Venus*, the *Earth*, *Mars*, *Jupiter* and *Saturn*, in aſcending order from the SUN, revolve round him, in the lower *focus* of their ſeveral *elliptical* orbits, as has been deſcribed; which, with the Moon's motion round the earth, four Moons, or *ſatellites*, moving round *Jupiter*, and five round *Saturn*, at the ſame time, conſtitute ſix primary, and ten ſecondary planets in our ſyſtem; beſides *comets* unnumbered, revolving, in variouſly inclined, and very eccentrical and remote *orbits*, croſſing the planetary orbs; all paying their reſpective *devoirs* to their *great Lord*, who commands their conſtant attendance, while they mutually gravitate, in their amours, acting on each other. The motion of each body, and particularly that of our earth, round the Sun, the immenſely greater body, is thus proved, by philoſophical principles. The common centre of gravity between the Sun and earth, or of any other diſtant body, being ſituate in the *Sun*, the leſſer body is compelled thereby to revolve round him.

BY the *earth*'s uninterrupted rotary and progreſſive motion, like the motion of a *rolling-ſtone* over a hill, carrying its poles nearly parallel, in an obliquity of $66°\frac{1}{2}$ with the plane of its *orbit*, the appearances of *Day* and *Night* are naturally accounted for; as likewiſe thoſe of the ſeaſons. And the poles of the earth being, again, ſuppoſed to move backward, in a ſmall circle, about a degree in 72 years, will account for the preceſſion of the *equinoxes*, or of the fixed Stars departing forward of their longitudes, according to what we experience.

THE quantity of motion of the planetary bodies in their ſeveral orbits, are ſet down farther on, according to the obſervations of Dr. *Halley*: To which tables are made farther additions and improvements, from thoſe publiſhed of that *celebrated* author's.

As to the *fixed Stars* appearing ſo glorious, in a ſparkling *canopy* round us, preſerving, very nearly, the ſame poſitions with one another, though at ſuch immenſe diſtances, they are, probably, *Suns* to different *ſyſtems*, or globes of matter, revolving reſpectively round them, but imperceptible to us, at ſuch diſtances. And theſe worlds, in the *univerſal ſpace*, or *Inane*, we may, with reaſon, ſuppoſe to be of *infinite* number, moving together:

gether round ſome *centrel* world, while each world has its reſpective motions; being moſt agreeable to the notion we have of the *divine Being*, filling *immenſity*, and ſupporting *immenſe* and *eternal exiſtence*.

AND as it would be abſurd to ſuppoſe the *great Being* unattended with numberleſs *beings* and *worlds*, 'till the time of a creation mentioned by *Moſes*, in the ſcriptures, within ſo ſhort a duration, as about ſix thouſand years ſince; ſo the late creation, there mentioned, can only be the new modelling of this earth from a *chaos*, with ſome few other *globes* put into new form and motion, reinſtating and reinhabiting them, from the ruins of an old world.

OF APPARENT, REAL, AND ABSOLUTE MOTION.

A PERSON carried in a ſhip under ſail in a river, will perceive the motion of outward objects, while he perceives not his own motion. And a ball being dropt from the maſt-head, at ſuch time, will fall in the ſame place on deck, as if the ſhip had no motion, though under the ſwifteſt way: and that by reaſon of the ſhip's motion under way, though ever ſo ſwift, being communicated to the ball, when it was dropt by the hand; by which they, and all bodies moving together, remain in the ſame relative ſituation, in motion, as at reſt. The earth moving at the rate of 15 miles per minute, and all bodies upon or near its ſurface moving together preſerve the ſame relative ſituation with one another; *Birds*, *Inſects*, *Fiſh*, *&c.* moving together with the atmoſphere and the water. As Flies and Inſects, ſhut up in a ſhip's cabin, preſerve the ſame ſituation, whether the ſhip is at anchor, or under ſail; the air in the cabin being carried with the ſhip. And a perſon can leap no farther on a ſhip's deck, under way, towards the ſtern, than with the way ſhe is going; becauſe, being carried with her, in the ſame motion communicated, he remains in the ſame relative ſituation, as if the ſhip had been at reſt; except, that he exerts more motion than the ſhip's, in jumping over-board. This exertion of motion would be the ſame as *flying* in the air, *ſwimming* in the water, or jumping upon deck, ſtill relative or comparative with the ſhip's motion, and with that exerted by the earth's abſolute motion, or reſt, being as hard to determine as *identity* of ſpace. For admitting a motion exerted by the earth, one exerted by the ſhip, and another by the man jumping on the deck; yet it is not improbable, that our whole *ſolar* ſyſtem may exert another motion,

independent

independent of all the reſt, &c. whereby worlds may move together, or move one another.

To outward *ſpectators*, at reſt, a perſon jumping on a ſhip's deck, under way, towards the *ſtern*, would appear not to move, if he exerted as much motion as the ſhip had way; but, jumping towards the *head*, would appear to have more motion than the ſhip. And the *retrograde* and *ſtationary* appearances of the planetary bodies, while their motions really continue forward, are accounted for by the motion of the obſerver with thoſe bodies, which is another argument for the earth's motion. The motion of the *celeſtial* bodies, ſeen from different ſurfaces, will appear very various; though, at the ſame time, they are, in reality the ſame.

OF THE CAUSE, AND MANNER OF ECLIPSES.

EACH *primary* and *ſecondary* body, in our *ſyſtem*, being globular, will always be enlightened on the ſide next the *Sun*, while the back part of it remains *opaque*, caſting out a *conical* ſhadow, terminating where the Sun's rays, as *tangents* to the extreme outer parts of the body's ſurface next him, interſect each other: All bodies that fall in the way of this ſhadow, are eclipſed by it, more or leſs. And the different *phaſes* of the Moon, and the other bodies, appearing *horned*, *gibbous*, *dichotomized*, and *full*, by having ſo much of their enlightened parts turned toward the *ſpectator*, are thence accounted for.

AND hence an *eclipſe* of the *Sun*, or rather of our earth, is cauſed by the interpoſing dark body of the *Moon* betwixt that *luminary* and the *ſpectator*'s ſight, ſo as to intercept his view of the Sun's light, either in part, or the whole; which can never happen but at *new Moon*, when the *Sun*, *Moon*, and *earth* are ſo near being in a right line, that the *conical* ſhadow, caſt by the Moon towards the earth, falls more or leſs upon it.

AN *eclipſe* of the *Moon* is occaſioned by the earth coming betwixt her and the Sun's body, and thereby depriving her of his light; which can never happen but at *full Moon*, when the *Sun*, *Earth*, and *Moon* are ſo near being in a right line, that the *conical* ſhadow caſt by the earth towards the Moon, falls more or leſs upon her.

IN an eclipſe of the *Sun*, or rather of our *earth*, the Moon's ſhadow travels at a determinate rate over the eclipſed parts of the earth's

earth's ſurface; and the Moon moving faſter through her orbit, than the earth through her's, ſhe likewiſe paſſes through the earth's ſhadow, at a determinate rate, in an eclipſe of the Moon: The dimenſions of which ſhadows, and their motions, with other *requiſites* concerning eclipſes, we ſhall now explain.

DIMENSIONS of the EARTH and MOON'S CONICAL SHADOWS IN ECLIPSES.

THE inverted *luminous* cone, terminating the *penumbral fruſtum*, next the *Sun*, being equal and ſimilar to the *umbral* cone, terminating on the oppoſite ſide of the interpoſing body, (on this ſide, in, or beyond the remote body from the *Sun*) and the *ſemi*-angle at the vertex of either cone being equal to the *Sun*'s apparent diameter, the altitude of the *earth*'s *ſhadow*, and conſequently of the *Moon*'s, will be thus determined by *trigonometry*.

SAY, as the *ſine* of the *Sun*'s apparent ſem. diam. at a mean diſtance from the earth, (*viz.* S. 16.) is to the ſem. diam. of the earth, ſo is radius of the earth, to 214,8 ſemi-diameters of the earth, the *height of the earth*'s *ſhadow*. But as the *Sun*'s apparent diameter is 15′ 50″ at his greateſt diſtance from the earth, the height of the earth's ſhadow, at that time, will come out 217 of the *earth*'s ſemi diameters; being above three times as great as the mean diſtance of the *Moon*, but falls ſhort of the orbit of *Mars*, and therefore can involve none of the heavenly bodies but the *Moon*.

Now the diameter of the earth, to the diameter of the *Moon*, being as 25 to 7, ſo is 214,8 to $60\frac{18}{125}$ ſemi-diameters of the earth, *the height of the Moon*'s *ſhadow*: the conical ſhadows of the *earth* and *Moon* being both ſimilar, becauſe the angle of the *Moon*'s ſhadow (and of all ſpheres whoſe ſemi-diameters bear no ſenſible proportion to their diſtance from the *Sun*) is the ſame with that of the earth.

HENCE, if the *Moon*'s diſtance from the earth be greater than her mean diſtance, or 60 ſemi-diameters of the earth, the *Moon*'s ſhadow cannot reach the earth, at which time there may be a *central* eclipſe of the *Sun*, but cannot be a total one, for then a bright luminous *ring* will appear to embrace the *Moon*'s body, then intercepting the *Sun*'s light every where, except about the circumference of his *diſk*.

NATURE

NATURE of ECLIPSES.

IF the *Moon*'s *anomaly* be leſs than three ſigns, or greater than nine, an eclipſe can no where be ſeen total; the diſtance of the *Moon* from the earth, in both which caſes, being greater than her mean diſtance.

THE breadth of the *Moon*'s ſhadow upon the earth, at her leaſt diſtance from it, is likewiſe eaſily computed to be about 220 *Engliſh* miles when it is circular, the *Sun* being in *apogeon* at the ſame time; but when the *Sun*, *Moon*, and *earth* are not in a direct line, and the conical ſhadow of the *Moon* is obliquely divided at the earth's ſurface, the ecliptical diameters of its ſection are determined by the *Moon*'s diſtance from the *Sun*, as if ſeen from the earth's centre. The quantity of the earth's ſurface alſo involved in the *penumbra* (being in *perihelion*, the *Moon* in *apogeon*, and the *Sun*'s apparent diameter 16′ 23″) will be about 4900 miles over the circular convexity: as in other poſitions of thoſe three bodies, the tranſverſe and conjugate axis of the *Moon*'s ſhadow on the earth's ſurface, may be determined. So likewiſe the *breadth* of the earth's ſhadow, at the diſtance of the *Moon*, is determined to be about three times the *Moon*'s diameter. From hence it is obſervable, that if the earth's body was equal to, or bigger than the *Sun*'s, that a *ſhadow* would run out behind it into *infinite* ſpace, and involve the bodies of *Mars*, *Jupiter*, and *Saturn*, coming in oppoſition to the *Sun*, which is never obſerved to happen; and therefore the *Sun* muſt be greater than the earth (as it is known vaſtly to exceed it) to terminate the earth's ſhadow at a nearer diſtance than thoſe *orbits*. And for the ſame reaſon, as the diameter of the earth's ſhadow, involving the *Moon*, is leſs than the earth's diameter, the *Moon* is therefore leſs than the earth.

IT is evident, that if the *Moon*'s latitude from the *ecliptic* be greater than the ſum of the diameters of the *Moon* and *Earth*'s ſhadow, the *Moon* cannot enter it; and if the *Moon*'s latitude be equal to thoſe two ſemi-diameters, the limb of the *Moon* will touch the earth's ſhadow, but not enter it. If the *Moon*'s latitude be leſs than their ſum, but greater than the difference, a *partial* eclipſe of the *Moon* will happen; but her latitude being leſs than the ſaid difference, an eclipſe will be total. Hence the *ecliptic* limits, or *Sun*'s diſtances from the *Moon*'s nodes at the time of eclipſes are determined, *viz.* Eclipſes of the *Sun*, at *new Moon*, always happen when the *Sun* is leſs than $16^{\circ}\frac{1}{2}$ from the *Moon*'s node;

and

Eclipſes of the *Moon*, at *full Moon*, when the *Sun*'s diſtance from her *node* is leſs than 12°.

THE *limits* of the eclipſe of the Sun are hitherto conſidered without allowance for the Moon's *parallax*, which is about one degree (and ſometimes more) near the horizon, called the *horizontal parallax*; and diminiſhes, in all degrees of the Moon's altitude, from the Horizon to the *Zenith*, where it vaniſhes. This *parallax* being the angle between the true place of the body, as if ſeen from the earth's centre, and the apparent place of it, actually ſeen from the earth's ſurface, or the angle, the ſemi-diameter of the earth *would be* ſeen under from that body, depreſſes the true place of it to the apparent, in all altitudes from the Zenith to the Horizon, by that *parallax*; ſo that the Moon having *north* latitude with us, it is thereby diminiſhed; or ſouth latitude with us, it is thereby encreaſed; as the *apparent* longitude of the Moon thereby alſo differs from the *true*: By which the *limits* of *ſolar* eclipſes are variable by a ſmall matter, according to each degree of latitude of the places where thoſe *eclipſes* are ſeen.

THE *Sun* being at ſuch an *immenſe* diſtance from the earth, the angle, which the ſemi-diameter of our earth *would be* there ſeen under, amounts to no more than 10', and therefore in computing the appearances of eclipſes, the Sun may be reckoned without *parallax*, that would affect the computation; though the ſame ſemi-diameter *ſeen* from the Moon is conſiderable, and about a *degree* when the Moon is at the point of our ſenſible Horizon.

THE *Angle*, under which the ſemi-diameter of the Moon's dark ſhade appears at the earth, when ſeen from the *Moon*, is equal to the difference of the *apparent* ſemi-diameters of the *Sun* and *Moon*, ſeen from the earth; and the apparent ſemi-diameter of the Moon's *penumbra*, ſeen from the Moon, is equal to the ſum of the apparent ſemi-diameters of both *Sun* and *Moon*, ſeen from the earth; as the earth's apparent ſemi-diameter, or that of the earth's *diſk*, being equal to the Moon's horizontal *parallax*, which a little conſideration will prove; the *apparent* ſemi-diameters of the Sun and Moon, and alſo the *horizontal* parallax, being calculated in *aſtronomical tables* to the ſeveral diſtances of the Sun and Moon from the earth, with the leaſt, mean, and greateſt *eccentricities* of the *lunar* orbit.

THE

THE DOCTRINE AND APPLICATION OF MORALITY.

Of true happineſs; and how to obtain it.

WORLDLY happineſs, or what is otherwiſe called *contentment*, might eaſily be attained, if we could bridle and reſtrain our ſenſual appetites. The things neceſſary to procure this great bleſſing are few in number, lie in a little compaſs, and are all comprehended in that ſhort petition of *Agur*—*Give me neither poverty nor riches, feed me with food convenient for me.* Prov. xxx. 8.—But alas! ſuch is the depravity of human nature, that there are few, very few, in whom ſome predominant paſſion does not interpoſe her ability to delude, and gratify her tyranny over the nobleſt part of man, his reaſon and liberty of reflection: ſeducing the powers of his ſoul to an implicit reverence of her magiſterial perſuaſion. Beſides the plauſible pretenſions, and engaging addreſs of this ſeducer to obtain our favour and eſteem, ſhe has the aſcendancy over our very nature to conquer our affections.

NOR is the *bait* contemptible: many people of parts and prudence, age, and religion, have been ſtaggered, and their virtue put to proof by her allurements: the *ruling paſſion* attending us in this life, throwing us daily into ſome confuſion and diſorder. So that the epidemical diſeaſe of avarice, the immoderate love of pleaſure, and inſatiable thirſt of ambition or power, bring us into continual ſlavery, and plunge us into the gulph of miſery; where all our thoughts and affections are ſwallowed up. Did happineſs conſiſt in the abundance of wealth, ſomething might be urged in favour of the miſer; but it is evident to common ſenſe, that betwixt the hopes of getting, and the fears of loſing, his mind is kept in a ſtate of continual anxiety.

There is no paſſion ſo mean or ſordid as *avarice*; and it does not appear how it is poſſible that thoſe who idolize riches, can be infected with that diſtemper without being liable to all the ſymptoms with which it is attended; ſuch as *pride*, *inſolence*, and *oppreſſion*, *unruline ſs* and *luxury*, and all the other inexorable tyrants of the ſoul! As ſoon therefore as any one gives himſelf over to ſuch inſatiable deſires, he gives over all thoughts of virtue, and looks upon that only to be juſt and honeſt, which is moſt uſeful and advantageous to himſelf. When men's minds and manners are thus corrupted, making it their buſineſs to defraud

defraud this man of his inheritance, to lay ſnares for another, to wheedle a third to make him his heir, to force unreaſonable gain out of every thing, and to expoſe even themſelves to ſale, they entirely diſcard that innate pleaſure that waits upon innocence, in exchange for thoſe boſom quarrels and anxieties that reverberate and ſting them to the heart.

Neither muſt we look for happineſs in courts and palaces. We are much miſtaken in the value of a crown. We admire it's brightneſs, but forget its *brittleneſs*, and gaze upon its glory, and conſider not it's frailty.—But if all the gay things were our own, which we fondly imagine are really to be met with in greatneſs, yet we ſhould find on reflection, that they are always purchaſed too dear. For it is a ſtanding *maxim* in policy, *that thoſe who covet dominion over others, firſt become ſlaves to the luſt of power.* Ambition knows no bounds; there is nothing ſo ſacred which it will not violate; it claims kindred with every vice, and ſtoops to take up every ſin that lies in it's way; as it is ſuch a complicated miſchief we ſhould avoid it ourſelves, and not be dazzled by it in others.

Nor is the ſenſual perſon happier than the great, in his ſearch of variety, and the diſappointments he meets with.—For, to obtain this ineſtimable *jewel* of happineſs, in the firſt place it will be neceſſary for us to have a thorough knowledge of ourſelves, and to obſerve what paſſions are moſt predominant in our nature. Then we muſt take counſel of our reaſon, and follow her dictates with ſteadineſs and reſolution, to avoid the dangers into which we are moſt liable to be precipitated. Nothing is more diſhonorable and ſhameful than to ſuffer our reaſon to be dethroned by every caſual temptation, whereby that divine principle which inſpects over, and governs univerſal nature, is brought under in man, and made ſubject to the yoke. But though reaſon ſhould ever ſit at the helm, and govern our paſſions, yet it ſhould not attempt to deſtroy them, while it's proper buſineſs is to regulate and controul them; not to govern them as ſubjects, but ſlaves.

A rational conduct does not therefore conſiſt in the fruitleſs auſterities and rigorous practices of religion: but in the charitable exerciſe of conſcience and reaſon, religion and morality, and in acting in conformity to their juſt dictates, if we expect to be happy; which is the true intereſt of the whole intelligent creation. And herein conſiſts that glorious reſemblance to the ſupreme and perfectly happy Being, dignifying men and angels, which

which if duly purſued and imitated, will promote our happineſs throughout all ages.

ON THE VICISSITUDES OF STATES AND KINGDOMS.

IT is obſervable that a *ſtate* ſubſiſts, and flouriſhes no longer, than whilſt it cultivates and improves the means to which it owed its *riſe* and *progreſs*. The firſt *Romans* were plain, hearty, and ſincere. They went to the wars with honour, and returned with ſucceſs; and their very enemies reaped the benefit of their victories, as well as themſelves; for their virtues always protected thoſe whom their valour had ſubdued. They fought for dominion, but not for tyranny, and choſe rather to be loved than feared. This made the provinces chearful in their ſubmiſſion, hearty in their contributions, and unwavering in their obedience. It is not ſo much to be admired, that, from ſo ſmall a beginning, they ſhould riſe to ſuch a ſtupendous height of greatneſs, as that ſo many qualities, productive of a real greatneſs, ſhould be found united in one people, diffuſing themſelves with ſo exact a tenor throughout every part, as to make up the very life and being of the whole.

How much the *Romans*, who lived in the age we are now writing of, were fallen off from that original perfection, I leave the reader to imagine. They were grown effeminate, factious, proud, and inconſiderate. The court was become debauched, the camp licentious, and the commonality obſtinate and mutinous. They were ſo far from puſhing on to new conqueſts, that they were not able to maintain their hereditary acquiſitions, &c.

HAVING lately received a *Packet* from *Dagal Hal Lagal*, Emperor of the Moon, with diſpatches of the higheſt importance, relating to the government, laws, and cuſtoms of the inhabitants of *Jupiter*, we here communicate the contents for the ſervice of the public.

HE firſt informs us, that this planet was always governed by Empreſſes. That the ſecretaries of ſtate, the prieſthood, magiſtracy, and all their courts of law conſiſt of females, who manage the helm of government, deal out divine oracles, diſpenſe juſtice, and plead cauſes between contending parties, as ſerjeants and counſellors do with us; but without a fee. The

women alſo were choſen governors of all their charitable inſtitutions.

THE men are engaged in employments ſuitable to their abilities. Their original form of government was much of the ſame nature with ours; but they ſoon found it neceſſary for the happineſs of the nation, by and with the advice and conſent of the whole community, to turn their courtiers into merchants and tradeſmen, their ſuperior and inferior clergy into regiments of ſoldiers, to ſtrengthen their armies, fight battles, and garriſon frontier towns.

THEIR lawyers were changed into pioneers to level mountains, drain marſhes, dig canals, make and mend roads, and do all other laborious works for the good of the public; ſo that fraud, oppreſſion, colluſion, and corruption, which before reigned among them, by the aforeſaid inverſion were intirely rooted out.

THEIR addreſs to their preſent Empreſs run thus in the higheſt ſtile. To the moſt potent, auguſt, pious, prudent, juſt, merciful, reſplendent, and magnanimous, *Adaſtrea*, *Roraura*, *Braru*, *Lieza Heightonba*, *Zabackthe Matrix*, Empreſs of the ſolar Syſtem; whoſe firſt favourite at this time, *Ciuluda Eſhul*, is ſtiled *Charmandra*. To their metropolitan. To the moſt reverend mother in God, *Shebal Drumbauda*, high prieſteſs of *Bonavital*, capital of *Jupiter*. To their judges. To the lady *Chif-diſintreſtralia*, and madam *Juſtriſtral*, &c. To the inferior clergy. *Veraveudral*. Their common lawyers are called *Amicitaaz*, &c.

TWO thirds of the late income of the prieſthood is now applied towards the ſupport of the army, conſiſting of parſons and lawyers: And the females, who perform the offices of religion, live upon the other third, are contented with their ſtations, and very exemplary in their morals; no pluralities being here allowed.

The ladies of the law, or *amicitaaz*, are maintained by a tax laid upon folly in general, and all public diverſions, ſuch as plays, aſſemblies, operas, balls, pleaſure-gardens, maſquerades, bagnios, &c.

A GREAT trade is carried on betwixt the adjacent *ſatellites* and this orb, by vaſt fleets of *habbernabs*, which continually paſs and repaſs through the intervening atmoſphere. The courtiers by this means are now an uſeful body to the community, and acquire prodigious fortunes, enriching the empire in general, and her *Imperial Majeſty* in particular, by this and other foreign

foreign intercourſe; ſo that here are no beggars, but all the poor are provided for by trade or manufacture.

CRIMINALS here are not put to death, except for murder, but are tranſported to the Moon, where they are kept, in a ſtate of confinement, to hard labour for life, or 'till their thorough reformation, and 'till compenſation is made for their lives.

IT is one part of the religion of this orb for the women not to have commerce with the men after their conception 'till they are delivered. And if any man is found in bed with his wife during the time of her pregnancy, he is brought to trial before madam *Juſtriſtral*, and being convicted of having carnal knowledge of her, he is tranſported to the lunar regions for life, like other notorious offenders: The *Empreſs* having firſt approved and ſigned the ſentence, which is only reverſible by the favour and intereſt of *Charmandra*.

THE young women here, cautious of loſing their virginity, are not ſuffered to enter upon marriage 'till twenty, before the conſummation of which they are ſtrictly examined by two experienced midwives, called *Bamboox*, who report their chaſtity to the prieſteſs of the pariſh, which report ſhe enters in a public regiſter, when, and not before, the bride is delivered to her huſband's embraces: But if it appears upon examination that ſhe has loſt her maidenhead, the marriage becomes inſtantly void, and the bride is baniſhed to the planet *Venus* for a common proſtitute; as are likewiſe the married women here, found guilty of adultery, who are reſtrained from that vice by taking a ſolemn oath, before the altar, twelve times in a year, of their fidelity to their huſbands.

THE *phyſicians* here are in a high eſteem for their uſefulneſs, and are called the *Grando Foquax*, being all females; they are obliged to paſs a public and ſtrict examination before they are allowed to practiſe, before the preſident madam *Kilpatrac*, the members of *clappux*, and a numerous aſſembly of learned auditors, met in the *Regal Kipotal*, or next royal *amphitheatre*.

THEY take no fees, but are paid for preſerving the health of the community by ſalaries allowed them out of the public revenue, and often relieve the patient who ſtands in need of their charity. The current money of this orb is pieces of *chryſtal*, of different colours and ſizes, ſtamped with the *Empreſs's* mark, to ſignify the value of each. Gold and ſilver are here of no worth. The ladies of the faculty keep no coaches, but viſit their near patients on foot, and are carried on *ſlamduks*, creatures

like *Engliſh* aſſes, to thoſe at a diſtance. They ſpeak but little, and in familiar language, and diſcover the nature of diſeaſes without any ceremony. Their medicines conſiſt chiefly of vegetables, with a few animal and mineral productions, and they chalk down their preſcriptions, with few marks, on a piece of board, which is ſent to the *haugslab*, the neareſt public repoſitory, where the medicines are delivered by the *ſlabber*.

OLD men are nurſes to the women, and old women nurſes to the men, ſo accuſtomed for the natural tenderneſs betwixt the ſexes.

EACH lady-phyſician is obliged to deliver to madam *Kilpatrac*, and the *clappux*-members, a journal of her practice and proceedings upon each reſpective patient, to be publicly read and examined in the next *Regal Kipotal*; and if any lives appear to be loſt through mal-practice, or neglect, ſhe is utterly diſqualified to practice for the future; but if her extraordinary ſervices appear in the preſervation of ſubjects' lives, ſhe is then regiſtered upon the liſt of merit, to be choſen one of her Imperial *Majeſty's* phyſicians in ordinary.

THE moſt flagrant vices reign in the army, called *blu bluſtrax*, and in the navy, or *vanal habbernabs*, whoſe people are irreclaimable, notwithſtanding the influencing example of the *ſwagdaghaggigs*, their principal commanders.

BACKBITERS, detracters, tale-bearers, ſcolds, pernicious liars, profane ſwearers, and ſtirrers up of ſtrife, have their tongues cut out for *mutes* to ſerve the government, as in *Turkey*.

SODOMITES are employed as kennel-rakers, chimney-ſweepers, and night men, in the *capitol*, and are diſtinguiſhed by *badges* from the reſt of the ſubjects.

GAMESTERS, if noblemen, are inſtantly degraded; and if commoners, are puniſhed by caſting a die, whether they *ſhall*, or *ſhall not*, be deprived of their fortunes: which fortunes, ſo forfeited, are applied to the uſe of the public, and the offenders employed as common labourers in the ſtate, for a maintenance. They have no *bridewells*; nor priſons but for holding offenders 'till trial. Debtors, ſottiſh drunkards, petty criminals, and thieves, if men, are puniſhed by being ſent to *work-houſes*, where they have no ſupport but from what they earn, for a certain time; and for every ſuch repeated offence, are obliged to ſuffer a double period of confinement.

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THE NOTIONS OF SPINOZA, AND ATHEISM CONFUTED.

BENEDICT SPINOZA, or *Eſpinoza*, was born a Jew, at *Amſterdam*, in *Holland*, but made no profeſſion of any *religion*, either jewiſh or chriſtian. He wrote ſeveral books in *Latin*, the moſt celebrated whereof is his *Tractatus Theologico-Politicus*, wherein he endeavours to overturn the foundation of all religion. The book therefore was accordingly condemned by a public decree of the ſtates; though ſince it has been publicly ſold, and even reprinted both in *Latin* and *French* in that country, and alſo in *Engliſh* at *London*.

SPINOZA here inſinuates that all religions are only political engines, calculated for public good, to render the people obedient to magiſtrates, and to make them practiſe virtue and morality.

HE does not lay down his notions of the DEITY openly; but only ſuggeſts his opinion. In his *Ethics*, publiſhed among his poſthumous works, he is more *open* and expreſs; maintaining that GOD is not, as we imagine him, an infinite, intelligent, happy, and perfect being; but only that natural virtue and faculty which is diffuſed throughout all creatures.

AND the great principle of this doctrine of *Spinoziſm* is, that there is nothing properly and abſolutely exiſting but matter, and its modifications; among which are even comprehended thoughts, abſtract and general ideas, compariſons, relations, combinations of relations, &c.

SPINOZISM is a ſpecies of *naturaliſm*, *pantheiſm*, or *hylotheiſm*, as it is ſometimes called, *i. e.* of the dogma, which allows of no God but nature, or the univerſe, and therefore makes it, and matter to be God; notions, long before *Spinoza*, held by many different ſects of philoſophers among the *Chaldeans* and *Greeks*: very much like the opinion of the *Stoics* and thoſe who held the notion of an *Anima Mundi*.

STRATO, and ſome of the *Peripatetics*, were of opinion ſomething like it. And though no ancient ſect ſeems farther removed from *Spinoziſm* than the *Platonic*, they attributing the greateſt freedom to GOD, and carefully diſtinguiſhing him from *matter*, yet *Gundlingius* proves at large, that *Plato* gives matter much the ſame origin with *Spinoza*: But the ſect that approached neareſt to *Spinoziſm*, was that which taught that all things were

ONE, as *Xenophanes* the *Colophonian*, *Parmenides Meliſſus*, and eſpecially *Zeno Eleates*; whence it obtained the name of the *Eleatic ſyſtem of Atheiſm*. To which the opinion of thoſe may be reduced, who held the firſt matter for God, as *Almaricus* and *David* of *Dinantum*. Alſo, the ſect of *Foe*, in *China* and *Japan*; the *Seufi* in *Perſia*, and *Zindikites* in *Turkey*, philoſophize much after the manner of *Spinoza*.

1. THAT there is but *one ſubſtance* in nature; 2. That this *only ſubſtance* is endowed with an infinite number of attributes, among which are *extention* and cogitation. 3. That all the bodies in the univerſe are *modifications* of this ſubſtance conſidered as it is *extended*; and that all the ſouls of men are modifications of the ſame ſubſtance conſidered as *cogitative*. 4. That GOD is a neceſſary and infinitely perfect Being, and is the cauſe of all things that exiſt; but is not a Being *different* from them. 5. That there is but *one Being and one nature*, and thus this nature produces within itſelf, by an *immanent* act, all thoſe which we call *creatures*. 6. And that this BEING is at the ſame time both *agent* and *patient*, efficient cauſe, and ſubject; but that HE produces nothing but modifications of *himſelf*.

THUS the DEITY is made ſole *agent*, as well as *patient* in all *evil*, both phyſical and moral, that called *malum pœnæ*, as well as *malum culpæ*: A doctrine, fraught with more *impieties* than all the heathen poets have publiſhed concerning their *Jupiter*, *Venus*, *Bacchus*, &c. What ſeems to have led *Spinoza* to frame this ſyſtem was the difficulty of conceiving either that matter is *eternal*, and different from *God*, or that it could be produced from *nothing*, or that an infinite and *free* Being could have made a world *ſuch* as this is.

A MATTER that exiſts neceſſarily, and which is nevertheleſs void of *activity*, and ſubject to the power of another *principle*, is an object that *ſtartles* our underſtanding, as there ſeems no agreement between the *three* conditions.

A MATTER created out of *nothing* is no leſs *inconceivable*, whatever *efforts* we make to form an *idea* of an act of the *will* that can change what before was *nothing* into *real* ſubſtance; contrary to the known *maxim* of philoſophers, *ex nihilo nihil fit*. In *ſhort*, that an infinite, good, holy, free Being, who could have made his creatures good and happy, ſhould rather chooſe to have them wicked, and eternally miſerable, is no leſs *incomprehenſible*; and amazingly ſo, as it is ſo difficult to reconcile the *freedom* of man with the equality of a Being made out of *nothing*.

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THESE appear to be the difficulties which led *Spinoza* to ſearch for a *new* ſyſtem, wherein GOD ſhould not be diſtinct from *matter*, and wherein he ſhould act *neceſſarily*, and to the extent of all his power, not out of himſelf *(ad extra)* but within himſelf. But if this *new* ſyſtem reſcues us from ſome difficulties it involves us in others infinitely greater. *Spinoza* is very full on the ſubject of the *authors* of the *ſcriptures*, and endeavours to ſhew, that the *Pentateuch* is not the work of *Moſes*; contrary to the common opinion both of the *Jews* and *Chriſtians*. And has alſo his particular ſentiments as to the authors of the other books; which part of the work has been anſwered by *M. Huet*, in his *Demonſtratio Evangelica*; and by *M. Simon* in his *Hiſt. Crit. du Vieux Teſt.*

NUMBERS have undertaken to refute *Spinoza*'s doctrine; but all very weakly, except what we have in *Dr. Clark*'s ſermons at *Boyle*'s lecture.

To which we ſhall add the opinion of ſome modern ſceptics, who acknowledge *God* in their actions, yet urge that ALL IS GOD, and that *all cauſes* and *all effects* ever exiſted in *one power*, as we ſee exerted in nature. That unleſs a cauſe could be found to *God* as *creator*, the wiſdom and power of *God* cannot be otherwiſe underſtood, than the wiſdom and power of *one nature*; ſelf-exiſting and ſelf-created. And *demand*, by what neceſſary, immanent, and wiſe cauſes did ONE GOD exiſt prior to *one univerſal nature*, to be the *cauſe* of it, and that very nature the *effect* of his creating power? And likewiſe how one neceſſary, original, ſelf-exiſting, and creating wiſdom and power is better underſtood than one neceſſary, original, ſelf-exiſting and wiſe nature! Alledging, that if *all nature* is not by neceſſity, or chance, that the cauſe of it, GOD, muſt come by *neceſſity* or *chance*: Diabolically making the CREATOR to be his CREATION, *i. e. all nature, and all cauſes and effects* therein produced.

ANSWER.

THE FOOLS HAVE SAID IN THEIR HEART, THERE IS NO GOD.

BUT if *ſelf-exiſting nature* is as incomprehenſible as *God (as all ſceptics allow)* and we find wiſdom and power diſpenſed through the world; it is more rational to give praiſe and adoration to one incomprehenſible wiſe and glorious CREATOR, as the

the cauſe of created *nature*, than to beſtow it where it is loſt (on *nature* itſelf) and what cannot reward us for our duty and gratitude.

CONSCIOUSNESS is the infallible *principle* of all we know, and by which we come to know any thing. Various are the *effects* we *conſciouſly* perceive are produced in nature, by various efficient *cauſes*. And every particular effect we conſciouſly perceive is adequate to its efficient cauſe, from whence every effect is ſingly and immediately produced: Whence it will follow, that the *immenſe*, *infinite*, and *wiſe exiſtence* of things that we ſee produced, and operating in nature, together, or in ſucceſſion, muſt proceed by an infinite *ſeries* of cauſes and effects, from a NECESSARY, ORIGINAL, ALL-WISE, ALL-POWERFUL, UNIVERSAL and INFINITE CAUSE, continually ſupporting and acting upon *nature*, prior to all natural cauſes, which is GOD from all ETERNITY, and FOR EVERMORE!

As we are *conſcious* of what is doing *well* or *ill*, and of *praiſe* or *blame* due to ourſelves or others, which conſciouſneſs proves the *diverſity* of our being and exiſtence, and that all is not *one* nature, it is *amazing* that men are ſo wilfully obſtinate and blinded in their underſtandings, as to acknowledge beings of ſuperior power and wiſdom on earth, whom they *adore*, and yet refuſe to acknowledge and *adore* a being ſuperior to *all!* THE CAUSE OF ALL!

I NEVER heard that the moſt obſtinate *ſceptics*, who refuſe to own the *free* being of a *God*, ever diſputed the free being of their *prince*, whoſe *laws* they willingly ſubmit to, and are bound to obey, or not have the privilege of his protection. They talk of every thing happening of *neceſſity*, and yet aſk *favours*, which ſhew their *doctrine* and their *conſciouſneſs* of things to be direct contradiction. They talk of *crimes* committed by *neceſſity*, deſerving puniſhment by *neceſſity*; and yet exclaim *bitterly* againſt the offenders! And I have heard them *praiſe* what they approve; though happening by *neceſſity*. Some I have known, in great fear of *puniſhment* for an offence given, aſk *pardon* to prevent it; which proves they are not conſcious of its *neceſſity*; but will deny *God*, and his glory for obſtinacy, 'till they come to fear him.

AND there can be nothing more *abſurd*, beſides impiouſly dangerous, and *diabolical*, than to diſpute the *free being* and exiſtence of *him* that made the *univerſe*, and all things therein, by ranking himſelf with his work, or making him inſeparable from

from it. For this neceſſity of a *pre-exiſting agent*, or CREATOR, is infinitely more probable than a *neceſſary nature* uncreated. The *voice* of all nations, and all nature, conſent to adore him, as CREATOR and ſupporter of all his glorious works; and ſhall the opinions and tenets of a few *paltry* ſceptics weigh againſt the general ſenſe and *belief* of all mankind?

REWARDS and puniſhments here, are ſufficient grounds to expect them in a ſtate hereafter. We live now but in the *dawn* of exiſtence: Where the greateſt proof of *immortality* is our continual new deſires, and our *hopes* and expectations of it, which could not be implanted in us for nothing. The *heathens*, improved in their reaſon, doubted and diſcovered *immortality*. And Mr. *Addiſon*, in his 210*th Spectator*, ſhews the meanneſs and abſurdity of expecting *annihilation*. The ſame gentleman alſo, in *Spectator* 185, ſhews, that *Atheiſts* are great zealots and bigots, and their opinions downright nonſenſe. That the creed of this generation of *wranglers*, requires an infinitely greater meaſure of *faith*, than any ſet of religious *articles*, for the good of mankind, which they ſo violently oppoſe.

THE ORIGIN OF POPES AND POPERY.

THE Author of the *Devil's Hiſtory*, ſpeaking of the *Devil* being out of play, for reſtoring idolatry, and finding himſelf at a loſs how to proceed with mankind, in the time of *Jovian*, the Emperor of *Rome*, who was a good *chriſtian*, he threw a *bone* of contention among the clergy for *primacy*, which fully anſwered his purpoſe. And declaring for the *Roman* pontif, in the following reign of the Emperor *Mauritius*, *Boniface*, who had long contended for the title of *Supreme*, fell into a treaty with *Phocas*, captain of the Emperor's guards, that he ſhould murder his maſter the Emperor, and his ſons; when *Boniface*, countenancing the *treaſon*, ſhould declare him Emperor; as *Phocas*, in return for the kindneſs done him, ſhould acknowledge the *primacy* of the church of *Rome*, by declaring *Boniface* univerſal Biſhop.

BY this notable deviliſh policy, *Satan* then got at the head of affairs in the *chriſtian* World, as well ſpiritual as temporal, eccleſiaſtical as civil; who never gained a more important point (ſays the Author) ſince his conqueſt over *Eve* in Paradiſe, 'till that time.

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THE *Devil*, indeed, is allowed to have proſpered tolerably well in his affairs for ſome time before this matter was accompliſhed, as his intereſt among the *clergy* gained ground, for ſome ages; but it was all a ſecret management, carried on with difficulty; ſuch as ſowing diſcord and faction among the people, perplexing the councils of their Princes, and wheedling privately in with the dignified clergy.

HE had raiſed abundance of little *church rebellions*, by ſetting up *hereticks* of ſeveral kinds, and raiſing them favourers among the clergy, ſuch as *Ebion*, *Cerinthius*, *Pelagius*, and others.

HE had drawn in the biſhops of *Rome* to ſet up the pageantry of the KEY; and while he, the *Devil*, ſet open the gates of *Hell* to them all, ſet them upon locking up the gates of Heaven, and giving the *Biſhop* of *Rome* the Key; it was ſo gilded over with *deluſion*, and ſo blindly the age received it, that like *Gideon's Ephod*, all the *catholic* World went a whoring after the *Idol*.

THE ſtory of this Key being given to the Biſhop of *Rome* by St. *Peter* (who, by the way, never had it himſelf) and of its being loſt by ſomebody or other (but the *Devil* never told who) is this:—It being found again by a *Lombard* ſoldier, in the army of King *Antharis*, who attempting to cut it with his knife, was *miraculouſly* forced to direct the knife to cut his own throat; which King *Antharis*, and his nobles ſeeing, were thereby converted to *chriſtianity*. And that the King ſent this *Key*, with another made like it, to *Pelagius*, then Biſhop of *Rome*, who thereupon aſſumed the power of opening and ſhutting heaven's gates; as he afterwards ſet a price or toll upon the entrance thereof, as we do for paſſing a *turnpike* in *England*.

THESE fine things were ſucceſsfully managed for ſome years (before the compact with *Boniface* and *Phocas* had taken effect) and the Devil gained a deal of ground; but when he had made an *univerſal* Biſhop, or *Pope*, he triumphed openly, by ſetting up a *Murtherer* upon the temporal throne, and a *church Emperor* upon the eccleſiaſtical throne, of his own chooſing; and ſo begun his reſtoration.

THE *Devil's* affairs went on ſwimmingly, and the clergy brought ſo many *gewgaws* into their worſhip, and ſuch deviliſh principles were mixed with that which we called the *chriſtian faith*, that from this time the Biſhop of *Rome* (now diſtinguiſhed by the name of *Pope*) commences *whore of Babylon*.

TYRANNY of the worſt ſort crept into the *pontificate*, errors of all ſorts into the profeſſion, and they proceeded from one thing

thing to another, until the very *Popes* (for ſo the Biſhops of *Rome* were now called) profeſſed openly to confederate with the *Devil*, and to carry on a perſonal correſpondence with him, at the ſame time they took upon them the title of CHRIST'S VICAR, and the infallible *Guide* of the conſciences of *chriſtians*.

THIS we have ſundry inſtances of in ſome merry *Popes*, who *(if Fame lies not)* were ſorcerers, magicians, had familiar ſpirits, and immediate converſation with the *Devil*, viſibly and inviſibly; by which means they became what we call *Devils incarnate*.

THE *helliſh* impoſture and wickedneſs tranſacted in church-government by the *Romiſh* clergy to this day, in thoſe countries where the Popiſh authority prevails, are diſmal inſtances of the corruptions of *original* chriſtianity; as they are ſhocking to all true *proteſtants* of the *reformed religion*, who ſee, by the infinite *maſſacres* of all heretics to popery, with what a vengeance the *Romiſh* clergy ſhew their authority, whenever they get the upper-hand. So far from their following the mild and pure doctrines of *Chriſt*, and his apoſtles, in bearing and forbearance, there is nothing ſo *wicked* or *inhuman*, but they will put in practice to eſtabliſh their church-tyranny over all men, even Princes themſelves, who preſume to diſpute, or doubt its *infallibility*. This conſideration ſhould make us charitable to thoſe *diſſenters*, profeſſing *chriſtianity* among us, who differ from us: As by that *reformation* which brought liberty and happineſs to *Great-Britain*, and for which ſo many ſuffered flames and martyrdom in effecting it, came the ſeveral *diſſentions* among us; wherein it is to be feared that *intereſt* or *Party* is more the prevailing *principle* than a *zeal* for *Chriſt*'s doctrines; even from the *ſmugglers* of the reformed *chriſtian* religion, down to the *hawkers* and *pedlars* of ſalvation; who would be better reſtrained by mild authority than by perſecution.

IN the times of *Fanatical Uſurpation* they had but little tenderneſs for a true church-man, and to this day the itinerant teachers make a market of the peoples' ignorance, and reproach our *lawful clergy*, as if guilty of crimes, whereof themſelves are chargeable.

THE *Scripture* is allowed to be the *ſtanding rule of faith*, (not fathers, creeds, catechiſms, &c.) as the departure therefrom is the infallible falling into *antichriſtian* apoſtacy; but men being allowed to preach the ſcripture doctrines, and explain them publicly, without being duly qualified, and legally authorized, excite a *frenzy* among the people, miſleading them into *groſs*

errors

errors and *superſtitions*, for private *lucre*. For the texts of the ſame ſcripture, we find are explained into as many different meanings, as ſuit with the intereſt of the *explainers*. And who but the *ignorant*, *ſuperſtitious*, *weak*, or *mad*, would run and pay for ſuch *enthuſiaſtic* abſurdity, or religious jargon, as are licentiouſly preached up and down the countries, at home and abroad, by *fanatic* diſturbers of the people? If no rule be eſtabliſhed for the preaching and practice of religion, there muſt in time be as many religions, and religious teachers, as there are people of different intereſt or party. And if the *clergy* of *England*, by law eſtabliſhed, are inſufficient for teaching the *true religion*, throughout his Majeſty's Dominions, thoſe *mercenary* ſtraggling teachers, who pretend to correct the church of *England's errors*, will be found far leſs qualified, and guilty of far greater errors, as well as of contempt of their ſovereign, who ſits at the head of the true church as GUARDIAN.

REFORMATION on reformation, and diſſention on diſſention, will be conſtant events where *nonconformity* is propagated: So long as a mercenary *nonconformiſt* finds it his intereſt to ſtir up and delude the people.

READ a book by *Benjamin Bennet*, intitled, *A Memorial of the Reformation;* for a farther account of the riſe and progreſs of popery, and of the infernal power of the church of *Rome*; alſo read the *Devil's Hiſtory*.

OF THE JEWISH YEAR; BEGINNING OF THE JEWISH DAY, AND THE MOTIVE OF THE LEGISLATURE FOR FIXING THE VERNAL EQUINOX ON THE 21*ſt* OF MARCH, INSTEAD OF THE 20*th*, AS IT NOW HAPPENS.

THE *Jews*, whoſe year conſiſted of *lunar* months, begun their month at the Moon's firſt appearance, and when it ſhould appear, if not clouded, (and not at the Moon's true change) of which proclamation was made in all public places, until their nation had loſt its authority; when they had recourſe to *Cycles*, for determining the day of *apparent* change, and the 14th day after, which they counted the day of the full Moon; though it *really* happened the 15th day from the true change. And hence the 15th day of the Moon came to be calſed the 14th, which was the *apparent* and *real* day of full Moon;

Moon; though ſome are apt to think it *really* happens the 14th after the *true* change.

THE *Jews* always begin their day at *Sun ſetting*, about three fourths of a day before our *aſtronomical* day begins. The *Arabians*, *Athenians*, and, in general, all theſe *Eaſtern* nations, who regulated their months and years by the courſe of the Moon, followed their *example*. And this cuſtom, (of beginning the day) prevailed among the ancient *Gauls* and *Germans*, and ſtill continues in *Bohemia* and *Poland*, where the clock ſtrikes twenty-four at Sun-ſet, and the *new* day begins. Regard being had to this cuſtom ſeems to be the reaſon why the church of *England* now orders the *collect* for any *feſtival* to be read in the *evening* preceding that feſtival. And the celebration of our *Eaſter* depending on the time of the *Jewiſh* paſſover, and that on the *vernal equinox*, if regard is not had to the *commencement of the Jewiſh day*, we ſhall ſometimes fall into the miſtake the *nirene council* were ſolicitous to avoid, by keeping our *paſchal feaſt* day of Chriſt's reſurrection, at the ſame time with the *Jewiſh paſſover*.

OUR preſent *political* day begins at *midnight*, yet ſome compute the *vernal eqninox* from the *aſtronomical* day, beginning 12 hours later, neither of which commencements are ſo much to be regarded in this affair, as the *commencement of the* Jewiſh *day at Sun-ſet*, preceding both theſe times, for avoiding our keeping *Eaſter* with their *paſſover*: For if the *vernal equinox* falls on the 20th of *March* (reckoning the beginning from midnight) ſome time after Sun-ſet of that day, and the full Moon falls later on the ſame day, after Sun-ſet, but before midnight, which may happen to be on a *Saturday*, then EASTER, (according to the rule for obſerving it, *(being on the Sunday after the full Moon which happens next after the vernal equinox)* ſhould be kept the next day, being *Sunday*, or the day after the *Jewiſh* ſabbath, ending at Sun-ſet, but the *Jews* then begin the 14th day of their eccleſiaſtical month *niſan*, on the 21ſt of their *March*, or 20th of ours, at Sun-ſet, whoon that 21ſt day following are by the law of *Moſes* to celebrate their *paſſover*; and therefore our *Eaſter* being made to fall with our 21ſt of *March*, that coincidence with our commemoration of *Chriſt*'s reſurrection, is avoided by a Moon.

IT was ordained, at the *nicene* council, *Anno* 325, and ſince by the *Britiſh Parliament*, that the *vernal equinox* ſhould be *conſidered* as happening on the 21ſt, (a day forward of the true) inſtead of the 20th of *March*, (as it then really happened (for

avoiding a coincidence of *Eaſter* with the *Jewiſh paſſover*, which yet is not prevented, if the *Jewiſh* method of computing the time of the *vernal equinox*, and full Moon next happening, is *fallacious*; whereby the *Jews* retarding a day may yet coincide with us, as in the preceding caſe, of the *vernal equinox* happening on the 20th: This is a *nicety* in diſtinction cannot always be made with certainty, (on account of their carrying the *vernal equinox* before the *end* of our day into the *beginning* of their next) and therefore the *vernal equinox* might as well have been fixed on the 20th of *March*, as it really happens. For, while we make the *vernal equinox* on the 21ſt, and the *Jewiſh*, or true *vernal equinox* to fall on the 20th of *March*, *Eaſter* is poſtponed a whole Moon, beſides the days to *Sunday* following; whereas it ought to have been kept the *Sunday* next after the *Jewiſh* paſſover, as it ſhould be kept when the *full Moon* of the *Jews* happens the day next after the *vernal equinox*; provided they keep their paſſover on that day; which yet is beſt determined by *aſtronomical tables* of the Moon's *mean* motion from the Sun. If the exact *true* time of the full Moon happening on, or next after, the *vernal equinox*, of *Jew* and *Chriſtian*, were duly fixed for determining *Easter*, difference will yet neceſſarily ariſe from the time of that *true* and the *mean* full Moon, often happening on different days in the ſame months of *March* or *April*. Or from either happening ſo near the *end* of one day and the *beginning* of the next, that the *true day* of happening may not be eaſy to aſſign.

YET, if the *legiſlature* had ordained an exception to the preſent rule for finding *Easter*, and made it *poſtpone* a week only, inſtead of a *Moon* and to *Sunday*, (from its original inſtitution) in caſes where the *Jewiſh* paſſover, and that *rule* ſhould happen to coincide, when the full Moon falls on the 20th of *March*, (which is the true time of the *vernal equinox*) though we had differed from the church of *Rome* herein, it had certainly been for our *honour*; the coincidence happening ſo ſeldom, would have required little trouble to correct; at the ſame time we had ſhewn our *ſtrict* adherence to a matter which the *Papiſts* themſelves acknowledge to be right.

The *form* of the *Jewiſh* year was *lunæ ſolar*, or a ſolar year, compoſed of 12 *lunar* months, beſides the intercalary, or *emboli-mean* month, *veadar*. The lunar months were called *pleni* and *cavi*, conſiſting of 30 and 29 days by turns. And this artificial *lunar* month ſeems to be regarded in our *old calendar*, making the

the Moon to have 30 days when the month has 31, and only 29 when it contains 30. The golden numbers pointing out the eccleſiaſtical Moon, (as 'tis called) are there fixed according to this ſuppoſition. The *embolimean*, conſiſting of 30 days, were added, when *neceſſary*, to keep the *lunar* year receding from the equinoxes, that the *paſſover* might be kept at the time *appointed*, making the equinoctial Moon the firſt month.

THEY uſed a *decennoval* cycle of the years like our own, of which 12 were common, and 7 *embolimean*. In their civil year they ſometimes added, and ſometimes omitted a day, to make it correſpond with the year aſtronomical; which, when common, contained 354 days, 8 hours, and 793 *helakim*, of 18 minutes each; and the *embolimean* 382 days, 21 hours, and 589 *helakim*.

THEY ſtrictly regarded their *tekuphæ*, or cardinal points, correſponding to the *equinoxes* and *ſolſtices*, as their year by this means was conſtantly regulated, ſo as never to require any ſuch reformation as the *julian* form, after a long period. For ſuch corrections were continually made and required by the conſtitution and form of their year, as was every way adapted to their *faſts* and *feſtivals* enjoined by the law.

BISHOP *Beveridge*, diſtinguiſhes their civil year into *deficient*, *abundant*, and *ordinary*. In the firſt, a day (he ſays) is taken from their aſtronomical year, whether common or embolimean; in the ſecond, a day is added; and in the third, the aſtronomical computation is unalterably obſerved. This author alſo takes notice, that they had likewiſe a *ſolar* year of the like extent with the *julian*. *See* Beveridge's *Inſtitutiones Chronologicæ*.

IN the preface to Dean *Prideaux*'s *connection, there is another good account of this Jewiſh year.*

THE REASONS FOR THE COMMENCEMENT OF THE DATE OF THE YEAR IN JANUARY, AND CORRECTION OF THE BRITISH CALENDAR.

THE Right Hon. the Earl of *Macclesfield*, in an excellent ſpeech made to the Houſe of Peers, on *Monday* the 18th day of *March*, 1750, *julian* ſtyle, explained to their Lordſhips the reaſonableneſs of having eſtabliſhed in *Great Britain*, *one uniform method* of reckoning or computing time, and of fixing the dates of all matters which may be tranſacted by the Inhabitants of much the greateſt part of *Europe*. His Lordſhip then

ſhewed the *abſurdity* of the legal commencement of the year in one part of our kingdom, differing by the ſpace of near three months from the legal commencement of the year in another part of the ſame kingdom, and alſo from the *general* uſage throughout the whole. In conſequence of which, it was eſtabliſhed by the legiſlature, that the date of the year, throughout *Great Britain*, ſhould commence the year following from *January* 1752.

His Lordſhip then made appear the neceſſary correction our *calendar* ſtood in need of, with regard to the *civil* year, to make the times of our *fixed* feſtivals, and *dates* of tranſactions thereon depending, as alſo the time of *Eaſter*, and *moveable feaſts* depending on *Eaſter*, accord with the practice of the greateſt part of *Europe*; for the right underſtanding and diſpatch of buſineſs, as well as the benefit of *commerce* in general. In conſequence of which, it was eſtabliſhed by the *legiſlature*, 1751, that the third of *September* 1752, according to the *julian* ſtyle, be reckoned the 14th day, *new ſtyle*, and ſo on; and that *Eaſter-limit* ſhould fall, and *Eaſter* be determined as formerly, from the 11 days ſo added; whereby our day of the month, and *feſtivals*, now correſpond in all thoſe countries who keep their account according to Pope *Gregory*'s correction of the calendar, in 1582: Preventing the ſeaſons running back, as in the *julian* account. *See the ſpeech, containing many things inſtructive and curious. See alſo remarks upon the* ſolar *and* lunar *years, the cycle of* 19 *years, commonly called the golden number, the epact, and a method of finding the time of* Eaſter, *as it is now obſerved in moſt parts of Europe; being part of a Letter from the Right Honourable* George *Earl of* Macclesfield, *to* Martin Folks, *Eſq. Preſident of the* Royal Society, *communicated* May 10, 1750.

THE CHRONOLOGY OF CHRIST's CRUCIFIXON.

OUR Saviour was kept up all *Thurſday* night, (before the *Friday*, or next day on which he was crucified) in the High-Prieſt's houſe, and led away in the morning to *Pontius Pilate*, (See *Matth.* xxvii. 1. compared with other Evangeliſts) who was then Governor of *Paleſtine*, under *Tiberius*, the Emperor of *Rome*. *Pontius Pilate* firſt ſent *Chriſt* to *Herod*, (*Luke* xxiii.) who ſent him again to *Pilate*, who took ſome time in examining him in the *Pretorium*, and in going out to confer with the

the people ſtanding without doors, leſt they ſhould be *defiled* by entering into a *Hall*, where a heathen acted as Judge. *See St.* John's *Goſpel compared with the reſt.*

It was juſt before the ſecond Cock-crowing, that *Peter* denied him, before he was ſent to *Pilate*. And it was about the third *Jewiſh* hour (or our 9 o'clock) according to St. *Mark*, when his *Crucifixion* was ordered or reſolved on. For, by St. *Luke's* Goſpel, he was hung on the Croſs about the ſixth hour, (or 12 o'Clock as we reckon) as he, as well as St. *Matthew* and St. *Mark*, mentions a *darkneſs* from the ſixth to the ninth hour; and St. *Mark* tells us, it was about the ninth hour (which we reckon three o'clock paſt noon) when he expired.

From whence it is plain, he was condemned about the third *Jewiſh* hour (or 9 o'clock as we reckon) arrived at *Golgotha*, or *Calvary*, at, or little before the ſixth hour, (or 12 at noon as we reckon) when the *darkneſs* begun, and expired at three in the afternoon, when the *darkneſs* ceaſed.

He did not live long on the croſs, as appears from *Pilate's* wondering at his being dead ſo ſoon; and that his death was towards *Friday* evening (*April* 3d, *Anno* 33) is plain, from the care the *Jews* took to kill the *Thieves* executed at the ſame time, by breaking their legs, (who had broke our Saviour's, if he had not already been dead) leſt the bodies ſhould remain on the croſs upon their *Sabbath Day*; Sabbath then happening at the time of the *Jewiſh* paſſover, or in their paſſover-week, which was a feſtival of ſeven days; though the paſſover was eaten on the firſt, according to St. *John's* Goſpel.

It was alſo the law of *Moſes*, that all who were hanged ſhould not remain after *Sun ſet*; and accordingly we find by St. *Matthew*, that St. *Joſeph* of *Arimathea* buried our Saviour that *Friday Evening*, ſoon after his execution. The *Jews* always begun their day at *Sun-ſetting*, (before we begin ours at midnight) from whence to *Sun-riſe* they reckon 12 equal hours, which was the former part of their day (as we reckon 12 equal hours from midnight to noon following). The latter part of their day was from *Sun-riſe* to *Sun-ſetting*, in which time they reckoned 12 equal hours more; and their firſt hour of *Sun-riſe* was about the ſame as our ſix o'clock; their ſixth hour, like our twelve o'clock at noon; and their twelfth hour, at *Sun ſetting*, about the ſame as our ſix o'clock in the evening. Theſe twelve hours were called *planetary* hours: and thoſe of the night, though equal among themſelves, were unequal to the planetary

or *Jewiſh* hours by day: which were alſo equal among themſelves (being each the twelfth part of time from Sun-riſing to ſetting) and at the time of the equinoxes, when the day and night is of equal length, the *Jewiſh* hours by day and night are therefore equal.

THE *Evangeliſts* have plainly pointed out the exact time of our *Saviour*'s *Crucifixion*, as well by the previous as ſuch ſequent circumſtances relating thereto; ſo that no perſon can be miſtaken in determining or fixing the day and hour of *Chriſt*'s ſuffering, when they mention a *darkneſs* ſpread from noon to three o'clock, according to our reckoning.

THIS *darkneſs*, by aſtronomical tables, is found to be no *natural eclipſe* of the Sun, as St. *Auguſtin*, *Origen*, *Eraſmus*, and others ſuppoſed; there being no *ſolar eclipſe* at that time. The *darkneſs* was not ſeen at *Athens*, or in other remote places; but extended itſelf only in the neighbourhood of *Jeruſalem*. The impoſſibility of the Sun's being totally dark in a ſolar eclipſe, for three hours, evinces the *darkneſs* to be miraculous! The *Jewiſh paſſover* being at the time when our Saviour ſuffered, at the firſt full Moon after the *vernal equinox*, which then was on *Friday*, *April* 3d, in the year of *Chriſt*, 33, (by aſtronomical tables) there could happen only an eclipſe of the Moon to the remote parts of the earth, preceding by about three hours, the time of his *Crucifixion*. The Moon could not at *Jeruſalem* hide the Sun's light at *Chriſt*'s ſuffering by day, when ſhe was below the horizon, the whole heaven's oppoſite; ſo that the *darkneſs*, ſpoken of by the *Evangeliſts*, muſt therefore be *miraculous*, and no natural eclipſe of the Sun.

Dionyſius, the *Areopagite*, then a young man in *Egypt*, of about 25 (well verſed in Aſtronomy for thoſe times) on occaſion of this *unnatural darkneſs*, when he ſaw the Sun hid, and no Moon preſent to hide it, cried out to his friend *Apollophanes*, *Aut Deus patitur, aut vicem patientis deflet; either God ſuffers, or is much concerned for him that ſuffers*; and many have thought the remembrance of this *incident* was a great ſtep in his converſion to *chriſtianity*, as appears by the preaching of St. *Paul*; (*See the Acts of the Apoſtles*) and alſo the dialogue between *Dionyſius* and *Appollophanes*, (quoted by *Strauchius* and others) as recited by *Suidas*, in his Lexicon, upon the word *Dionyſius*. *Phlegon* the *Trallian* (an *Heathen* writer,) ſpeaks of this *miraculous darkneſs* as of an eclipſe, in theſe words:

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"In the fourth year of the 202d Olympiad, there happened "the greateſt eclipſe that ever was known;" for he took this miraculous darkneſs for an eclipſe; as in thoſe times the true cauſes of eclipſes were but imperfectly underſtood. The *epocha* of the Olympiad begun in the 3938th year of the *julian* period at the calends of *July*; therefore the fourth year of the 202d *Olympiad* muſt be completed in the 4746th year of the *julian* period, in the ſummer; and this was the year on which our Saviour ſuffered, has been plainly proved by *Scaliger*, *Strauchius*, and others; being in the year of our Lord 33, (according to *Dionyſius*, the author of that *Æra*) and on *Friday* the 3d of *April*, by the *julian* account; which was the 14th day of the *Jewiſh* month *Niſan*: for which we have alſo the concurring teſtimony of *Philo*, the *Jew*. *Tacitus*, in the 15th book of his annals ſays, "The firſt founder of the *Chriſtian name was one* "CHRIST, who was put to death under the reign of *Tiberius*, "by *Pontius Pilate*, then governor of *Paleſtine*."

AND *Joſephus*, (a well known Jewiſh hiſtorian) of great authority), in the 5th chapter of the 18th book of his Antiquities tells us, that *Vitellius* having advanced his friend *Marcellus* to the government of Judea, ordered *Pilate* to return to Rome, to anſwer to the Emperor *Tiberius* ſuch matters as the Jews had objected againſt him, and *Pilate* having governed the Province ten whole years, being obliged to ſubmit to *Vitellius*'s orders, ſet out for Rome, but before he could reach that city, *Tiberius* died, ſo that *Pilate*'s government, and *Tiberius*'s life terminated in the ſame year; and that *Tiberius*'s happened in or about the 4750th year of the *julian* period, or according to *Dionyſius*, the year of our Lord 37—ſo that *Chriſt* ſuffered between the years 27 and 37 is plain: which event muſt therefore happen in that year betwixt the two, when the *paſchal* full moon happened on a *Friday*, which is according to the authority of the Evangeliſts, who tell us, that the *Crucifixion* was on a *Friday*, as before obſerved. We are alſo told, that the day of our *Saviour*'s Reſurrection was on a *Sunday*, the third day inclufive from the day of his ſuffering, which was immediately made the Chriſtian Sabbath, as from the beginning, in the room of the Jewiſh Sabbath, before and ſince kept on a *Saturday*.

Now, there was no year between the 27 and 37th year of *Chriſt* inclufive, but the 33d year, on which the *paſchal* full moon could happen upon the 3d day of *April*. This fell out about noon at *London*, and conſequently correſponded to about half

half an hour after nine o'clock, as we reckon, at *Jeruſalem*, or about the 16th hour from the beginning of their fifth *Feria*, or week day, (beginning according to the Jewiſh reckoning on the *Thurſday* after ſun-ſet) which *aſtronomically* ſet down is *April* 2d, 21 hours and half, Anno 33, or the 4th hour on *April* 3d, by the Jewiſh reckoning.

OTHER chronological events might be produced for aſcertaining the time of our Saviour's paſſion; as *Caiaphas*'s high prieſthood, St. *Luke*'s account of the time of our Saviour's baptiſm, if the teſtimonies hitherto advanced to corroborate *Phlegon*'s account of the time of the *miraculous darkneſs* happening at that time (of our Saviour's ſuffering) were not ſufficient, and the true time of the *paſſion* not indiſputably proved.

THE CONTROVERSY OF PHLEGON's ECLIPSE, AT CHRIST's SUFFERING, DECIDED.

A CONTROVERSY about *Phlegon*'s *Eclipſe* was begun by Dr. *Sykes* who endeavoured to ſhew, that *Phlegon* meant *a common eclipſe* of the Sun, and becauſe no ſuch eclipſe happened the 4th year of the 202d olympiad, he would have it, that it was the firſt year of that olympiad, and that the numeral Δ, by which the Greeks ſignified 4, was made a δ by the careleſsneſs of tranſcribers, and was at firſt probably an A to denote the *firſt* year; and of this ſuppoſed change of the α into δ, he found his conjecture, *or what he calls his proof*. But not to mention *Whiſton*'s anſwer, (who mixes ſo much chaff with his wheat) alledging the Apochryphal authority ſuperior to that of the beſt hiſtorians, and equal to that of the ſacred writ itſelf, as to be not worth regarding, Mr. *Chapman* of Cambridge, M. A. took up the cudgels againſt Mr. *Sykes*, (who had before writ a reply to *Whiſton*) and makes a nice and critical enquiry into *Phlegon*'s account of this eclipſe, and the ancient authors who have mentioned it, diſtinguiſhing thoſe who had it at firſt hand from *Phlegon*, from thoſe who barely tranſcribed from them; and in ſhort does a great deal to corroborate *Phlegon*'s teſtimony. Dr. *Sykes* replies to this, and *Chapman*'s rejoinder puts an end to the controverſy.

THEY all agree that the year of *Chriſt*'s *paſſion* was the 4th of the 202d olympiad, (which has been already proved) and look upon

upon it as past all dispute; but they differ in respect to the eclipse, and also an earthquake, mentioned by *Phlegon*, which *Sykes* would have to be in another year of the olympiad, and consequently not that which happened at our *Saviour's passion*: *Chapman* has fully proved it to be the same, and that the passage in *Phlegon*, which relates to it, is *genuine*.

"And in the IVth year of the CCIId olympiad, there was "an eclipse of the Sun, the greatest that had been known (or "observed) before. 'Twas night at the sixth hour of the day, "insomuch, that the stars appeared in the heavens.—And there "was also a great earthquake, in Bythynia, which overthrew a "great part of the City of Nice."

To confirm the truth of this passage, Mr. *Chapman* observes, that there are no less than seven ancient writers, *three Greek*, [viz. *Eusebius*, the author of the *Chronicon Paschale*, alias *Chronicon Alexandrinum*, who quotes this passage of *Phlegon* twice; and *Johannes Philoponus*] and *four Latin*—[viz. St *Jerom*, *Anastatius*, the author of the *Historia Miscella*, and *Freculphus Lexoviensis*] who all lived while the works of *Phlegon* were yet in being, (the latest of the Greek writers being about the year 600, and the latest of the Latins about 814) all quoting or translating this passage from *Phlegon*, and all concurring in one uniform representation thereof, and in one reading of a controverted numeral. A number [of writers] very extraordinary and of great weight; there is not, I believe, (adds the learned author) any ancient chronological fragment in a hundred (of those which are now extant) so well attested and supported as those of *Phlegon*.

Those who have a mind to examine the controversy relating to this affair, may consult these pamphlets, containing arguments on both sides.

"Dissertation of the Eclipse mentioned by *Phlegon*, or an Enquiry whether that Eclipse had any relation to the Darkness which happened at our Saviour's Passion. By *Arthur Ashley Sykes*, D. D. Printed at London, 1732."

"The Testimony of *Phlegon* vindicated; or an Account of the great Darkness and Earthquake, at our Saviour's Passion, described by *Phlegon*, including all the Testimonies, both Heathen and Christian, in the very Words of the original Authors, during the first six Centuries of Christianity, with proper Observations on those Testimonies. By *William Whiston*, M. A. London, 1732."

"Phlegon

"PHLEGON examined critically and impartially, in Anſwer to the late Diſſertation and Defence of Dr. *Sykes*. To which is added, a Poſtſcript, explaining a Paſſage in Tertullian.—By *John Chapman*, M. A. Fellow of King's College, in Cambridge. London, 1734."

"A SECOND Defence of the Diſſertation upon the Eclipſe mentioned by *Phlegon:* Wherein Mr. *Chapman*'s Objections, and thoſe of the A of a Letter to Dr. *Sykes*, are particularly conſidered. By *A. A. Sykes*, D. D. London, 1734."

"PHLEGON re-examined—in Anſwer to Dr. *Sykes*'s ſecond Defence of his Diſſertation concerning *Phlegon*. To which is added, a Poſtſcript concerning the Chronicon Paſchale. By *John Chapman*, Fellow of King's College, Cambridge. London, 1735." Ending the Controverſy.

THE ſix Diſſertations publiſhed by *William Whiſton*, in 1734 need not be regarded, one of which is a reply to Dr. *Sykes*'s Defence of his Diſſertation. He falls ſhort of *Chapman*, and has nothing valuable but extracts from ſome original authors, (in which he is ſcarcely to be truſted) and the calculations of ſome eclipſes, which help to ſet matters right in the ſaid controverſy. *Chapman* entirely diſregards him, oppoſing no one but Dr. *Sykes*, calls in no aſſiſtance, nor refers to *Whiſton*, or any other.

PHLEGON was an heathen, born at Tralles, a City of Lydia, and when he grew up, became a Libertus, or Freedman, of the Emperor *Adrian*, and was much eſteemed for his learning, and the works he publiſhed. Among other pieces, (of which a catalogue is ſtill in being), he wrote one of more note and eminence than the reſt, entitled, A Chronological Account of the Victors of the Olympic Games, beginning with the firſt Olympiad, and continued down to the 229th, in ſixteen books. Of this ſome fragments now remain (of which the paſſage in diſpute is one) but the whole work was extant in *Photius*'s time, who lived in the ninth century; for he tells us he had it in his hands, and made conſiderable extracts from it. One may judge it muſt have been a very long and valuable work, and of great ſervice towards ſettling many points in ancient chronology. We alſo find that the whole work was extant in *Suidas*'s time, who lived about 200 years after *Photius;* but when it was loſt is uncertain. What we would chiefly obſerve from this is, that *Phlegon* did not live at the time of the eclipſe he mentions (as ſome have ſuppoſed and argued on that ſuppoſition) but

tranſcribed

tranſcribed his account of it from the annals of thoſe times, which might give a much more particular account of the eclipſe and earthquake, that accompanied it, that *Phlegon* has done, or than perhaps ſuited his purpoſe to tranſcribe. And what pity, that ancient writings are not more preſerved, that we might take our proſpects from the ſhoulders of Giants.

THE evidence wanted by ſome, of the generality or univerſality of the earthquake and eclipſe, might poſſibly or not poſſibly be there found. And thus endeth the ſtory of an eclipſe and earthquake! being a *miraculous darkneſs*, and *miraculous eruption*, obſerved only in that part of the earth when and where *Chriſt* ſuffered; and for which he came to ſuffer as God and Man, for the general redemption and ſalvation of mankind. Notwithſtanding which neceſſary event, thoſe who were acceſſary to his ſuffering, or of putting the King of heaven and earth to ſo great *Pain* and *Indignity*, are doomed to eternal miſery! Like Henry the VIIIth, and his abettors, who were the providential inſtruments of bringing about a Reformation of Religion; but intended only the accompliſhment of their own wicked and villainous deſigns.

OF PRIMITIVE AND REFORMED CHRISTIANITY.

THE corruptions of *Popery*, and the *Pope*'s authority, are ſometimes confounded with the wholeſome doctrines of the council of *Nice*, every way different from each other.—The preſent reformed Church of *England* owes its authority to that council, not to the *Popiſh* Church of *England* before the reformation.

OUR church receives and acknowledges the authority of the council of *Nice*, held Anno 325, and of the three ſubſequent councils. She rejected the errors and corruptions of popery ſince crept into the church doctrines, but embraces the decrees and determinations of the Nicene councils, which were all of them held before popery had good footing, and before the *Popes* uſurped their pretended ſupreme authority over all eccleſiaſtical and temporal affairs, and alſo over all Chriſtian princes.

THE council of *Nice* met only to determine the Arian Controverſy, and to regulate the feſtival of *Eaſter*; for we every *Sunday* and *holy-day* repeat that very Creed, which was then firſt

firſt drawn up, together with the additions made thereto by the following councils; and now keep *Eaſter* according to the decrees of that council, and therein differ from the cuſtom of the ancient *Britons*.

HENRY the VIIIth's reformation of the Church of *England* ſhook off the Pope's authority to give a ſanction to his adultery, and more freely to exerciſe his tyranny and oppreſſion. He diſſolved the monaſteries for the ſake of their wealth, though religion and reformation were his pretended views. 'Tis certain, if he had any religion, (which is much to be queſtioned) that he lived and died a *Papiſt*, in all points except the Pope's ſupremacy, which he rejected, and perſecuted all that owned it; except thoſe who were as much *Papiſts* as himſelf.

HE burnt *Papiſts* and *Proteſtants* in the ſame fire; the former for not acknowledging him to be *Pope*, and the latter for rejecting thoſe *ſix articles* which contained the very marrow of popery.

'TIS true, the ſteps taken towards a reformation in his reign facilitated it in the next; but no thanks to him, who intended no ſuch thing, and was only accidentally an inſtrument thereof, as his wicked actions happened providentially to be productive of future good; or rather he was the *wicked tool* by which Providence wrought *good* out of *evil*: So that the reformation ought no more to be aſcribed to him than the ſalvation of mankind to *Judas* the traitor, who was an *inſtrument* of bringing it about, though he meant no more, as before obſerved, than the accompliſhment of his own villainous deſigns.

THE TEMPLE OF FOLLY:

A VISION.

THE following Viſionary Scenes, if rightly conſidered, convey very inſtructive morals: There you have a real picture of mankind ſurrounded with all their Foibles, Vanities, and Imperfections. A THOUGHT of this kind, ſo capable of affording uſeful Hints, and inoffenſive Admonitions, may not be unentertaining to the Reader, as it is pointed at no particular perſon, but levelled at the general depravity of the whole nation.

FALLING into a DREAM, (after ſome late fatigues) I *imagined* myſelf WALKING by the ſide of a pleaſant Grove, meditating upon my own *inadvertencies*, and contemplating the *frailties* of human nature. METHOUGHT, at ſome diſtance, I obſerved

obſerved a *perſon* making haſtily towards me: By the richneſs of his dreſs I took him for a *young Heir* juſt entered upon poſſeſſion of his eſtate; having ſet up a ſplendid equipage to ſquander what his frugal father with ſo much care and pains had got together. *Curioſity* prompted me to give him the meeting, and to ſalute him in a manner ſuitable to his appearance; not doubting but from a compleater view I ſhould find greater *Scope* for ſpeculation, which fell out juſt as I expected.

DRAWING near, I beheld the Hat of this *wonderful perſonage* very large, bound with a broad Gold Lace; his Wig was of the bag-kind; his Waiſtcoat of various colours, intermixed with flowers of gold and ſilver; his Coat was covered with ſundry kinds of *Hieroglyphics*, and above the middle, on his back, was affixed a large oval plate of gold, from which a ſilken line hung down, with a bearded Fiſh-hook, and about it on the plate, was engraven in capitals, NON CAPIO, NISI CAPIOR. He had wings on his ſhoulders, like a *Cherub*; in his right hand he held an *enchanted* rod, with which he could render himſelf and others *inviſible*; in his left hand he held a *toy* or RATTLE, reſembling that with which nurſes pleaſe children.

COMING up, he addreſſed me with ſo becoming an air of complacency, and ſo eaſy and graceful a negligence, as ſhewed him to be educated in one of the politeſt courts of *Europe*.—We immediately entered into converſation, and he ſoon made me ſenſible, that I had met with a perſon well worthy of my acquaintance: A perſon! who, notwithſtanding the oddity of his apparel, was poſſeſſed of all the moſt amiable qualifications, both of body and mind.

HAVING entertained me for a while with elegant diſcourſes on different ſubjects, the diſtinguiſhing *characteriſtic* of good breeding, he thus proceeded.—"I perceive, *ſir*, you are in a "*ſerious* mood, I have for ſome time, from a principle of good "manners, co-operated with you in imagination; now do you "accompany me, for a few hours and I will place before your "eyes the *real* thing which you now fancy repreſents the *ima*-"*ginary ſcene*. I am *high prieſt* of the GODDESS FOLLY, and "will conduct you to her TEMPLE, give you a full view of "that *ſtupendous* edifice, and read you a lecture upon every *claſs* "of her numerous *votaries*." I readily accepted the offered favour, when, waving his *magic* wand over my head, we were both, as I thought, inſtantly raiſed from the earth, paſſed ſwiftly through the air, and came to a delightful plain, or garden, em-

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belliſhed with ſtatues, caſcades, fountains, grottos, groves, viſtas, walks, parterres, and every other ornament of ancient and modern Invention. In the *centre* of this beautiful ſpot ſtood the TEMPLE of FOLLY, a very magnificent and amazing ſtructure! built with *Egyptian* marble, curiouſly wrought, into which my *guide* now conducted me, by an eaſy aſcent. He firſt led me up to the *temple* to his own apartment, ſituated at the right hand of the GRAND ALTAR, over which the GODDESS herſelf preſided. Paſſing along, I obſerved, on each ſide, numberleſs little *chapels*, dedicated to different *idols*, and furniſhed with every *article* that nature and art could produce, in order to captivate the ſenſes. When I entered the place of his *reſidence*, he ſeated me in an eaſy chair, covered with *crimſon velvet*, laced with gold. Having refreſhed ourſelves, he opened the door, walked backwards and forwards, before the *grand altar*, and ſhook his *rattle* for the ſpace of a minute, which made a very *ſhrill*, though no inharmonious *echo*; thus declaring himſelf,—"The dreſs I now appear in, which I imagine, *ſir*, has cauſed your ſurprize, is the regular *habit* appropriated to my *high office*. This *rattle* you ſaw me ſhake, is the ſummons to ſeveral *votaries* to attend their reſpective Altars, and perform the *rites* thereto belonging. The *deities* to whom they are raiſed, receive *delegated* power from the SOVEREIGN GODDESS; and this vaſt congregation conſiſts of ſuch attendants, only, as are inflamed by the objects of *ſenſe*, who give a looſe to their inordinate deſires, and obey their *irregular* paſſions, inſtead of the dictates of reaſon. Thoſe who can judge rightly of the *cauſes* of action, and diſtinguiſh what *ought to be deſired* from what *ought to be avoided*, and put their judgments in practice, have no buſineſs here. The SOVEREIGN GODDESS preſſes no man into her ſervice; for her attendants are all voluntary, purſuant to the meaning of her *motto* I bear, *Non capio, niſi capior*.—But the *temple* now fills.—Take this *wand*, go where you will, none can ſee you; when the *ceremony* is over return to me."

I ſtaid ſome time at the *altar*, where my *friend* officiated, and took a full view of the *Sovereign Goddeſs*, who was ſeated in a yellow velvet chair of ſtate, under a *ſatin* canopy, of the ſame colour; her *complexion* was fair, and her features *agreeable* but much prejudiced by her *ridiculous* geſtures, and continual *laughter*. On her head was a *crown* of gold, hung round with little *bells*, like thoſe on a child's *coral*, which made a continual though no inharmonious jingling. Her *hoop* extended five yards on

on each ſide. Before her ſtood a table covered with *toys* of all ſorts, the offerings of her *devotees*, with which ſhe *played*, and ſeemed delighted. Her *votaries* were all diſguiſed, looking like a mixed multitude, compoſed of all nations upon earth; and were divided into *ſmall parties*, whiſpering and ſqueezing in a confuſed *hum*.

TIRED of this ſtation, I took a turn round the *Temple*, and having obſerved the different *idols*, in each compartment, I went to the *Theatre*, thence the *Opera-houſe*, and laſt of all to the *Great room*, where ſome were *dancing*, ſome *gaming*, ſome *cavilling*, ſome *wheedling* and *flattering* for intereſt, and ſome betraying their friends.

HAVING rambled about for a conſiderable time, without ſeeing one object that could afford me *true* pleaſure, I obſerved the *Goddeſs of Folly* to withdraw, and her congregation diſappeared.

I HASTENED to my friend's apartment, who obſerving me more inclined to *melancholy* than *mirth*, was pleaſed to entertain me with the following diſcourſe, on the *ſtrange* ſights that I lately had appeared before me.

"THOUGH you have had a *curſory* view, SIR, of all the *follies* incident to mankind, perhaps you may be at a loſs to gueſs how ſuch a multitude of *fools* could poſſibly be aſſembled: permit me therefore to inform you in what manner I gain ſo many *proſelites* to, and adorers of, the GODDESS whom I ſerve; and for what reaſon *we* indulge their ſeveral *ruling* paſſions. I travel through all *Europe*, and when I find a *party* addicted to what is called pleaſure, but in fact *curioſity* and wanton *ſenſuality*, I ſhake my *rattle*, and, *inſtantly*, I am encircled round; I, without *much* conjuration, can readily diſcern how many of theſe *fools* are fit for my *purpoſe*. I invite them to my *Levee*, and having *allurements* ſuited to every inclination, I make them ſuch offers of my favour and friendſhip, that, greedily *ſwallowing the bait*, or *taking my hook*, they enliſt, with great joy, under the banner of my *patroneſs*. The inhabitants of your *iſland*, male and female, have many humours among them, to whom I *annually* pay a viſit, and ſeldom fail of gaining my miſtreſs many proſelites: For the *weakneſs* and *depravity* of mankind cannot be more conſpicuous than in employing their time and acquiſitions there to *ignoble* purpoſes. Hence you beheld at the *grand altar* ſo many *devotees* of diſtinction, all *maſqueraders!* Perſons in high

" life, who, according to the proverb, keep *holiday all the year*. " These over-act the vices of the *vulgar*, both in public and pri- " vate conduct, and are juſtly diſtinguiſhed by their *want of* " *diſcretion*. Thus, again, if a man finds himſelf addicted to " *anger*, and ſuffers not his intellectual faculties to perform " their functions, I create in him, by my *allurements*, an *inſa-* " *tiable* thirſt for revenge, that opportunity permitting him to " gratify, *dire* reflection may ſucceed; while he ſurrenders " himſelf into my *cuſtody*, and plays the fool by ſurrendering his " own quiet and happineſs at the ſame time.

" If any are troubled with *pride*, the attendant of *ſelf-conceit*, " and ambition gains the aſcendant over them, I allure them to " adhere to thoſe views which entail their deſtruction.

" If they delight in pleaſing the *palate*, or to *ſtupify* their " ſenſes with drinking, I allure them to exceſs and drunken- " neſs, that they may play the fool with their conſtitutions, " their health, and their peace of mind.

" If to pleaſe the *eye*, or the *ear*, be their favourite inclina- " tion, I allure them to follow *obſcenity*, *plays*, *oratorios*, *muſic* " *meetings*, *balls*, *operas*, *aſſemblies*, *gardens*, *routs*, *drums*, *drum-* " *majors*, *riots*, and *hurricanes!* that they may hear and ſee ob- " jects for enhancing their *vain ideas*; and inflammatory *luſt* " taking poſſeſſion of them, or a deſire of being diſtinguiſhed " for *trifles*, I cauſe them to ſquander their ſubſtance idly, and " to feel want for their not applying it to charitable or uſeful " purpoſes; who are ſo great *fools* as to think of nothing but " *actual* enjoyment with all the *fine* faces they meet among the " *brilliant* fair.

" You might obſerve the *idol faſhion*, peculiarly adored by " the *fair ſex*, to which they have ſo many different ways of " *worſhipping* and *ſacrificing*. Some you might behold pay " their devotion in the *habits* they wear; others, by the ſacri- " fices they make. Some think the *Idol* is a great lover of " *whalebone*, or *cane*, and therefore I allure them to be ſo *ſilly* " as to wear ſeveral yards of both ſorts about their legs, and to " caſe their bodies with coats of mail made of the former; ſo " that their ſhapes may be reduced to the form of a taper to- " bacco-ſtopper. Others, who are inclined to think that the " *Idol* will eſteem them for wearing *frizzled ſheep's heads*, or " *têtes de mouton*, I allure to become ridiculouſly expenſive, by " purchaſing *ſham* locks, while nature has furniſhed them with " *better* locks of her own. Thouſands of the *country folk* I al-

" lure

" sure with great zeal to sacrifice to this *idol fashion*, their time, " their money, their quiet, and too often their reputation.

" I SHALL not pretend to enumerate all the various instances " of lewdness, intemperance and vanities that have appeared " to you at this cursory view, in the *Temple of Folly*; but in " *general*, I, like *Circe* in the fable, omit no arts to *allure* per- " sons of all *degrees* and *denominations*, and especially strangers."

HERE my friend paused a while, and thus proceeded. " There " are several other *meannesses* to which I allure mankind; such " as to behold the prosperity of others with a *grudging* eye; " to look upon the *afflicted* without a *sympathizing* concern; to " hug *resentment*, when, by properly shewing it, a good under- " standing might ensue; to be pleased with the *imperfections* of " others; to procure self-applause; to be silent when the cause " of another should be maintained; and to be guilty of other " *disingenuities* of the like kind, bordering on pride and envy, " are all objects of my bait. *Folly* and *inadvertency* are very " near relations, and my business is to gain them *proselites*, by " my various snares and allurements, and my endeavours sel- " dom fail of success.

" OUR indulging mankind in their *favourite* passions, is by " way of *chastisement*. You must be sensible, SIR, that the " too frequent repetition of pleasure of any kind makes it *nau-* " *seous*, and palls the appetite: It is for this reason all that offer " sacrifices to the respective *idols* in the *Temple of Folly*, are " obliged to submit to corporal punishment, as often as the " *goddess* shall think fit. Hence, the *devotees* grow weary of " their *duty*, and there are *few*, but would gladly return to *good* " *habits*, which we seldom allow.

" BUT, it gives me pleasure to find there is one *Ulysses*, who " can withstand all the charms and allurements he has had re- " course to." The *goddess* now returning to the *Temple*, be- fore a multitude of *adorers*, and the Temple-Bell sounding to worship, my friend too, beginning to shake his *rattle*, I started upon my seat, which awaked me.

THE PHILOSOPHY OF MANNERS, WITH THE DOCTRINE AND APPLICATION THEREOF TO HUMAN CONDUCT.

THE mischiefs daily arising from the common neglect of decency, and good manners, are a proof of the import-

ance of ſuch neceſſary conduct in our behaviour as may prevent thoſe evils.

A STATESMAN, *Lawyer*, *Divine*, *Orator*, or *Diſputant*, of the greateſt talents, requires a degree of demeanour and addreſs to engage the attention and bias the inclination of his hearers, before he can perſuade them to a right opinion; and therefore too much care cannot be taken to acquire *that quality*, which muſt ſet off all the *reſt*; and which ſerves to correct thoſe *ſoleciſms* in behaviour, which men, either through giddineſs, or a wrong turn of thought, are moſt likely to commit to their own diſadvantage.

POLITENESS is not leſs an *ornamental* accompliſhment than a thing *neceſſary* to procure happineſs, connected as cloſely with ſmall things as with great; which may be obſerved from the *croſs*-accidents to be met with relating to trifles: For *diſquiet* is found a very great evil, let it ariſe from what cauſe it will.

IN the concerns of common life, as well as among perſons of rank and fortune, it may be obſerved, that numbers are brought into bad circumſtances from ſmall neglects, more than from great errors in material affairs: For ſhillings and pence, ſo lightly thought of by many people, go to the making up of large ſums.

OUR duty to our neighbour is not ſufficient when we pay our debts, and do him no *injury*; we owe him farther obligations of *civilities*, *complacencies*, and *endeavours* to give him pleaſure, in order to preſerve the true reliſh of life, in reciprocal enjoyments; as alſo in his affection and eſteem, procured by means of politeneſs done him.

HONORIUS is a perſon equally diſtinguiſhed for his birth and fortune. His natural good ſenſe has been improved by his education. His *wit* is lively, and his morals unſpotted, yet he has contracted a notion, that it is beneath the man of *true* honour to fall below the height of truth in any degree, upon any occaſion whatſoever. From this principle, and the habits he has fallen into, he ſpeaks abruptly whatever he thinks, without any regard to the company or place where he is. He read a lecture on female *hypocriſy* before a married couple, where the lady was violently ſuſpected of it. Soon after he fell into a warm declamation on *ſimony* and *prieſtcraft* before *two dignitaries* of the church; he is therefore more dreaded than eſteemed by his acquaintance.

PRUDENTIUS,

PRUDENTIUS, on the contrary, came into the world under great diſadvantages of birth and fortune; yet by his behaviour he has acquired a handſome eſtate in the country, on which he lives with greater reputation than moſt of his neighbours.

HIS readineſs to do *obliging offices* gained him the love and eſteem of his inferiors; his deference to thoſe in high ſtation procured him their good-will; and the *complacency* he expreſſed towards his equals, and thoſe immediately above him, made them eſpouſe his intereſt with almoſt the ſame warmth as their own! By which means he roſe to preferment; and affluence has made no alteration in his manners.

THE ſame *eaſineſs of diſpoſition* ſtill attends him in that fortune to which it has raiſed him; who is, at this day, the delight of all who know him; from an art he has of perſuading them that *their pleaſures* and *their intereſts* are equally *dear* to him as his *own*.

WHO then, if it were in his power, would refuſe what *Honorius* poſſeſſes? But who would not wiſh that poſſeſſion accompanied with *Prudentius*'s talents, and ſweet diſpoſition?

THE practice of *politeneſs* does not require, that a man ſhould fall into a careleſſneſs, or contempt of ſcience; ſince a neceſſary ſtock of *knowledge* will diſtinguiſh every one from the *pedant*, and adorn his other qualities. *Perſpicuity* ſhould run through all his eaſy diſcourſe; and *candour* and *ſincerity* appear in all his thoughts and actions.

RELIGION, which is become the jeſt of *fools*, ſhould be always treated with the utmoſt reſpect: For what can be a greater offence, or more ſhocking to good ſenſe and manners, than to ſpeak ludicrouſly, or with contempt of "That worſhip, which "men, from a ſenſe of duty, pay to that *Being*, unto whom "they owe their exiſtence; with all thoſe bleſſings and benefits "attending it?"

ALL party-diſputes and politics muſt be ſet aſide, and reflections on men's profeſſions; and all expreſſions, or behaviour whatſoever, that are any ways liable to give *pain*, ſhould, with the utmoſt caution, be avoided.

INVECTIVE, *ridicule*, and *raillery*, are very offenſive weapons! and dangerous to be dealt with; the playing with which, for diverſion, being ſimilar to jeſting with the point of a *naked ſword*, inſulting or wounding the perſon it is turned againſt. A falſe ambition, envy, and ill-nature, often prompt

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the poſſeſſor to employ theſe weapons, by making continual war againſt the more worthy.

A SUDDEN *vehemence* in diſcourſe is not a little ſhocking to others, at the ſame time it *exhauſts* not a little the perſon who puts it in practice; contrary to the rules of good breeding. This defect ariſes from *impatience* at the difference of opinion, while we are equally guilty in cheriſhing the ſame *tenacity* in ourſelves.

IF ſubmiſſion to others be a thing diſagreeable, why ſhould we expect it ourſelves? *Truth* can only juſtify tenacity of opinion; and if we calmly lay down what is *reaſonable*, it will hardly fail of convincing thoſe to whom we ſpeak. Heat produces heat; and the claſhing of opinions ſeldom fails to ſtrike out the fire of diſſention. Paſſion excites oppoſition, and that very oppoſition, to a man of tolerable ſenſe, ſhould be the ſtrongeſt reproof for his inadvertency.

As this *foible* is more eſpecially incident to the *fair ſex*, it may not be amiſs to remind them, likewiſe, that *paſſion* is as great an enemy to beauty, as it is to truth; it diſcompoſes the ſweeteſt features, diſcolours the fineſt complexion, and gives the air of a *fury* to the face of an *angel*. Whereas, to effect what they wiſh, what can be denied to beauty, ſpeaking with an air of ſatisfaction? *Complaiſance* does all that *vehemence* would extort; as it is anger alone can abate the influence of their charms! *Redundancy* in converſation is a fault, rather from *careleſsneſs* than *deſign*; and is the more dangerous the leſs it is conſidered.

A PERSON of a *loquacious* diſpoſition may eſcape *open cenſure* from the reſpect due to his quality, or from an apprehenſion in thoſe with whom he converſes, that a *check* would but increaſe the evil, and, like curbing a hard-mouth'd horſe, tend only to make him run a head the faſter; from whence the perſon in *fault* becomes often rivetted to his error, by miſtaking a ſilent contempt for a profound attention.

CONVERSATION ſhould be looked upon as a ſort of *bank*, in which all, who compoſe it, ſhould have their reſpective and proper ſhares. The man who attempts to *engroſs it* treſpaſſes upon the rights of his companions in partnerſhip, and whether they think fit to tell him ſo or not, he will not of conſequence be regarded as a *fair dealer*.

CONVERSATION differs from other co-partnerſhip in one very *material* point, which is *this*; that it is worſe taken if a man pays

pays in more than his proportion, than if he had not contributed his full *quota*; provided he be not too far deficient.

SOME of the *fair ſex*, when paſt the *noon* of life, or in the *wane* of their beauty, are apt to diſoblige their hearers with topics of *detraction*, by which they reduce the light of thoſe ſtars to gild the hemiſphere only, where they once ſhone with ſparkling and replendent luſtre.

SOME men are guilty of *egotiſm*, or ſelf-panegyric, to the great *leſſening* of themſelves, and *diſturbance* of others; and this is a *weakneſs*, the bare mention of which ſhews it to be an improper topic to entertain company; yet there are men perpetually *introducing* and *recommending* themſelves; who appear amazed at the coolneſs of their auditors, by forgetting that there is ſcarce a perſon in the room, who has not as good an opinion of himſelf, at *leaſt*, as of any body elſe.

DISQUISITIONS of this kind, into human nature, properly belong to *ſages* in polite philoſophy; the *firſt principle* of which is not to offend againſt ſuch diſpoſitions of mind, as are almoſt inſeparable from our *ſpecies*; to find out and *methodize* which, require no ſmall pains and application. Reflections on theſe ſort of ſubjects will open a ſenſe of *novelty*, which is attended with a moſt powerful recommendation.

THE character of a *Marplot*, in an aſſembly of *impertinents*, ſhould be carefully avoided.

INSTANCES might be produced of Major *Ramble* engroſſing a tedious converſation on his travels, for an hour, in company with gentlemen who he knew had ſeen all and more than he deſcribed; wherein a deſire of diſplaying his own parts buried every other circumſtance in oblivion. When Dr. *Hectic* ſtarted a ſubject on medicinal *Bath* waters, and tried the company's patience for a conſiderable time, without ſtaying for their approbation; Mr. *Mathematics* ſat ſilent. But, the moſt unaccountable of all, Mr. *Papillo*, after all theſe impertinencies, read the company a lecture upon a *Medallion*, to make them amends for the late *queer converſation* he had obſerved; when every one loſing all patience, took up their hats and went away without ſaying a word.

THUS far the *rocks* are deſcribed on which is ſplit the *bark of good manners*, and all thoſe *paſſengers* of life ſet adrift who would arrive at the *character of being agreeable*.

HAVING conducted you to the door of the world's *great ſchool*, you muſt enter and practice the precepts here laid down, (avoiding

(avoiding all *poſitiveneſs* and *affectation*) and make what further obſervations your *experience* can diſcover. Your beſt way to improve will be from converſation with the FAIR SEX; who, in general, poſſeſs all the accompliſhments of *politeneſs* in an eminent degree, and are qualified to teach the *Utile & Dulci*; by whoſe means, alone, you may arrive at the ſummit of *Mount Pleaſant*.

OF THE SUPREME BEING AND CREATOR OF THE UNIVERSE; AND HIS INFLUENCE AND DOMINION OVER ALL HIS WONDERFUL WORKS.

AS we cannot but conceive the *univerſe* as depending on the *firſt cauſe* and *chief mover*, whom it would be abſurd, not to ſay *impious*, to exclude from acting in it; ſo we have ſome hints of the manner in which he operates in *nature*, from the *laws* which we find eſtabliſhed in it. Though he is the ſource of all efficacy, yet we find that place is left for *ſecond* cauſes to act in ſubordination to him; and *mechaniſm* has its ſhare in carrying on the great *ſcheme* of nature. The eſtabliſhing the equality of action and re-action, even in thoſe powers which ſeem to ſurpaſs *mechaniſm*, and to be more immediately derived from them, ſeems to be an indication, that thoſe powers, while they derive their *efficacy* from him, are however, in a certain degree, circumſcribed and regulated in their operations by *mechanical* principles: and that they are not to be conſidered as mere immediate volitions of his, (as they are often repreſented), but rather as inſtruments made by him, to perform the purpoſes for which he intended them.

For *example*; if the moſt noble *phænomena* in nature be produced by a *rare* elaſtic *etherial medium*, as Sir *Iſaac Newton* conjectured, the whole efficacy of this *medium* muſt be reſolved into his power and will, who is the ſupreme cauſe. This, however, does not hinder but that the ſame *medium* may be ſubject to the like *laws* as other elaſtic fluids, in its actions and vibrations; and that if its nature were better known to us, we might make curious and uſeful diſcoveries concerning its effect from thoſe *laws*. It is eaſy to ſee that this conjecture no way derogates from the government and influences of the *deity*, while it leaves us at liberty to purſue our enquiries concerning the nature,

ure and operations of such a *medium*; Whereas, they who hastily resolve those *powers* into immediate volitions of the *supreme cause*, without admitting any intermediate instruments, put an end to our enquiries at once, and deprive us of what is probably the most sublime part of philosophy, by representing it as *imaginary* and *fictitious*; by which means they hurt those *interests* which they appear so sanguine to promote; for the higher we rise in the *scale of nature* towards the *supreme cause*, the views we have from philosophy appear more beautiful and extensive. Nor is there any thing extraordinary in what is here represented, concerning the manner in which the *supreme cause*, acts in the *universe*, by employing *subordinate* instruments and agents, which are allowed to have their proper force and efficacy: for this we know is the *case* in the common course of nature; where we find *gravity*, *attraction*, *repulsion*, *&c.* constantly combined and compounded with the *principles* of mechanism. And we see no reason why it should not likewise take place in the more subtle and abstruse *phænomena* and motions of the system. It has been demonstrated by ingenious men, that great revolutions have happened in *former times*, on the surface of the earth; particularly from the *phænomena* of the *strata*, which sometimes are found to be in a very regular manner, and sometimes to be broken and separated from each other to very considerable distances, where they are found again in the same order; from the *impressions* of plants left upon the *hardest* bodies, dug deep out of the earth, and in places where such plants are not now found to grow; and from bones of animals, both of land and sea, discovered some *hundreds* of yards beneath the surface of the earth, and at very great distances from the sea.

Some *philosophers* explain these changes by the revolutions of *comets*, or other natural means. But as the Deity has formed the *universe* dependent upon himself, so as to require to be altered by him, though at very distant *periods* of time; it does not appear to be a very *important question* to enquire, *whether* these changes are produced by the *intervention* of instruments, or by the same immediate influence which first gave things their form.

We cannot but take notice of one thing, that appears to have been designed by the *author* of nature: He has made it *impossible* for us to have any communication from this earth with the other great bodies of the *universe*, in our present state; and it is highly probable that *he* has likewise cut off all communication

betwixt

betwixt the other *planets* and betwixt the different ſyſtems. We are able by *teleſcopes* to diſcover very plainly *mountains*, *precipices*, and *cavities*, in the Moon; but who tread thoſe precipices, or what purpoſe thoſe great *cavities*, (many of which have a little *elevation* in the middle) ſerve, we know not; and are at a loſs to conceive, how this *planet*, without any *atmoſphere*, *vapours*, or *ſeas*, (as it is now the common opinion of *aſtronomers*), can ſerve for like purpoſes as our earth.

We obſerve ſudden and ſurpriſing *revolutions* on the ſurface of the great planet *Jupiter*, which would be fatal to the inhabitants of the earth. We obſerve in them all enough to raiſe our curioſity, but not to ſatisfy it.

From hence, as well as from the ſtate of the moral world, and many other conſiderations, we are induced to believe, that our *preſent ſtate* would be imperfect without a *ſubſequent* one; wherein our views of nature, and of its great author, may be more clear and ſatisfactory. It does not appear to be ſuitable to the *wiſdom* that ſhines throughout all nature, to ſuppoſe that we ſhould ſee ſo far, and have our *curioſity* ſo much raiſed, concerning the works of *God*, only to be diſappointed at the end.

As *man* is undoubtedly the *chief being* upon this globe, and this globe may be no leſs conſiderable, in the moſt valuable reſpects, than any other in the *ſolar ſyſtem*; and this ſyſtem, for ought we know, not *inferior* to any in the *univerſal ſyſtem*; ſo, if we ſhould ſuppoſe man to periſh, without ever arriving at a more complete knowledge of nature, than the very *imperfect* one he attains in his preſent ſtate; by *analogy*, or parity of reaſon, we might conclude, that the like deſires would be fruſtrated in the *inhabitants* of all other planets or *ſyſtems*; and that the beautiful ſcheme of nature would never be unfolded, but in an exceedingly imperfect manner to any of them. This therefore naturally *leads* us to conſider our preſent ſtate of *preparation* or *probation* for farther advancement: Which appears to have been the *opinion* of the moſt judicious *philoſophers of old*. And whoever attentively conſiders the conſtitution of human nature, particularly the *deſires* and *paſſions* of men, which appear greatly *ſuperior* to their preſent objects, will eaſily be perſuaded, that man was deſigned for higher views than this life. Theſe the author of nature may have in reſerve, to be opened to us, at proper *periods of time*, and after due preparation. Surely it is in his power to grant us a far greater improvement

of

of the *faculties* we already poſſeſs; or even to endow us with new faculties. [*For we know things in our preſent or any ſtate but according to our ways of perception; and our knowledge and faculties, in a new ſtate, may be different, and the preſent be of no uſe. We may perceive every thing intuitively, in vaſt* plans *of* ideas, *or without external ideas, by the conſtitutions of things; with a power of not forgetting, and to aſſume faculties or ways of knowledge, as* ſuits *our purpoſe or deſign; and of making extenſive compariſons and concluſions; and may exiſt in a form requiring no nouriſhment or ſupply of ſubſtance, from motion, as in our preſent mortal ſtate of being.* Pal. Author.] Of which, at this time, we have no *idea*, for penetrating farther into the ſcheme of nature, and approaching nearer to himſelf, the firſt ſupreme cauſe. We know not how far it was proper, or neceſſary, that we ſhould not be let into knowledge at *once*; but ſhould advance *gradually*, that, by comparing *new objects*, or *new diſcoveries*, with what was known to us before, our *improvements* might be more complete and regular; or *how far* it may be neceſſary, or advantageous, that intelligent beings ſhould paſs through a kind of infancy in knowledge. For *new knowledge* does not conſiſt ſo much in our having acceſs to a new object, as in comparing it with others already known; obſerving its relations to them, or diſcerning what it has in common with them, and wherein their diſparity conſiſts.

Thus our knowledge is *vaſtly* greater than the *ſum* of what all its objects ſeparately could afford; and when a new *object* comes within our reach, the *addition* to our knowledge is the greater the more we already know; ſo that it increaſes not as the new objects increaſe, but in a much higher proportion.

EFFECTS OF BAD COMPANY.

1. BAD COMPANY is ruinous to fame and reputation.

2. Judging men look on others for the company they frequent; according to the old proverb, *ſhew me your company, and I'll tell you the man.*

3. *Ill* company often gives an incurable wound to reputation.

4. Revelling with *proſtitutes*, and parading with *gamblers*, wert thou a *king*, thy reputation could not be ſafe.

5. *Ill company*, like *objects* beſmeared with filthineſs, beſmear all thoſe who come near or touch them.

6. *Ill company* is the ruin of youth, and the reproach of age.

7. *Ill company* is the *grand engine* with which the *devil* effects moſt of his purpoſes on mankind.

8. *Ill company* is to be ſhunned as *deadly poiſon*, or as a *ſnare* laid for your ſafety and welfare.

9. Unavoidable and innumerable *miſchiefs* and misfortunes attend the keeping *bad company*.

10. Many men have been good till they were *ill* aſſociated.

11. Pure water changes its quality and virtue by paſſing through *pernicious* minerals.

12. When *vice* runs in a *ſingle ſtream* or *rivulet*, it is ſhallow and fordable; but when many of theſe vicious ſtreams fall and unite into one large and deep *channel*, the *unwary* are drowned therein.

13. Good and wiſe aſſociates are like *princes* in offenſive and defenſive leagues againſt the common enemy; one is a *bulwark* for the mutual ſafety and protection of the other.

14. Bad companions and aſſociates, like a *jack o'lanthern* or miſguiding light, lead the unwary, inſenſibly, into ambuſcades.

15. *Evil companions*, like the *ſyrens*, allure men into dangerous *follies* and deſtructive *vices*.

16. He, who frequents *evil company*, requires ſtronger *antidotes* carried about him, than are carried by a *phyſician* viſiting his infected patients.

17. It is *better* to have *no* companion or aſſociate than to have an *ill one*.

18. *Acquaintance* is ſimilar to *commerce*, or dealing of one tradeſman with another; begun by accident, continued by cuſtom or inclination, and revocable, on either ſide, at pleaſure.

19. When a commerce of acquaintance happens between two perſons, and is carried on in mutual confidence; and if, through inadvertency, either finds himſelf deceived in his choice, by diſcovering the other to be *evil-minded;* he, by prudent and ſafe meaſures, ſhould ſhake him off, as St. *Paul* did the *Viper*.

20. When *eſteem* is forfeited, acquaintance, or even friendſhip, is broken.

21. When a *wife* forfeits her *honour*, ſhe forfeits her huſband's eſteem: Her dependance is on the law, and her happineſs to be ſought.

22. A *worthy* and *honeſt companion* of either *ſex*, is like a *guardian angel!*

MISCELLANEOUS

MISCELLANEOUS AND MORAL OBSERVATIONS.

1. THE *Tyger* kills to ſatisfy his hunger; but wicked and more cruel man has often betrayed to miſery his *protector*, *preſerver*, and *deliverer*, for gain.

2. Of ſo *little* moment is difference of country for defining a perſon's *true* character, that the honeſt, tender, and generous ſentiments of a wild *Indian* have been found to ſurpaſs thoſe of one of a *politer* nation.

3. How *weak* the charms, how *ſhort-lived* the triumph of *beauty*, attended with *pride* and *inſolence!* And how powerful and laſting the *attraction* of a well-cultivated mind, with a condeſcending, chearful, and obliging behaviour!

4. Were men to pay a more *general* regard to *real* worth, in their choice of a *partner* for life, the *fair ſex* would, doubtleſs, be more careful to adorn their minds, inſtead of truſting ſo much to dreſs, and the fading charms of their perſons.

5. The *force* of true wiſdom is ſeen, in the *practices* of life, to reſtrain or change the worſt diſpoſitions, though ever ſo ſtrongly ſeated in the conſtitution.

6. The *generous* mind will never value itſelf upon what can make no part of its worth, but as it is worthily employed.

7. How requiſite is a *liberal* education, regular conduct, and a juſt ſenſe of things, to adorn a great eſtate!—Were this *rule* more generally obſerved, we ſhould not ſo often ſee *mean* ſpirits, and *rude* and *ridiculous behaviour*, in men of *fortune;* whoſe wealth only ſerves the more ſtrongly to expoſe them to contempt and ridicule!

8. It is *impoſſible* for a mind, untainted with *mean intereſted views*, not to feel a variety of *emotions*, from ſeeing the worthy and amiable in deep diſtreſs.

9. How cruel does that tyrant appear, who arrogates to himſelf a power over the children to which he is *guardian;* and *ſacrifices* to his own grovelling paſſion, and lucrative views, their *real* happineſs! to promote which happineſs was the *real* deſign and limits of his authority. Yet we find there are frequent *inſtances* of ſuch men having exiſted.

10. How hard it is for a *bad* man to diveſt himſelf of his fond conceit of his own *abilities*, when employed in a *bad cauſe!* A moderate opinion of ourſelves is perhaps one of the laſt virtues we ſhall attain.

11. Of *how little* value and dependance are the *ſtrongeſt* profeſſions of love and friendſhip, in a heart *abandoned* to the wild ſtarts of paſſion, flying from one extreme to another!

12. It is *prudent* ſometimes to ſmother reſentment, and even to repay *great offences* with *great benefits*. By theſe means we may gain over a powerful and dangerous enemy to become a faithful and ſure friend; as well as to enjoy the *godlike* pleaſure of returning *good* for *evil*.

13. The *baſeſt* returns for the *greateſt* obligations raiſe a *horror* in the honeſt mind, ſhocking to human nature! Yet we may learn, from the *exemplary* danger of liſtening to *temptation*, how ſoon it may ſeduce us to *liſten* to what we moſt *deteſted!* For, he who can be *falſe* to his God, and can make his *religion* ſubſervient to his *intereſt*, is not likely to prove true to his *friend*.

14. This world, or ſtate of being, may be likened to an *Inn*, where one *generation* is continually paſſing off, and another ſucceeding.

15. Let none, however inſignificant he may think himſelf, imagine *that he is neglected by his Creator*. For every ſtation, as far as it is *providential*, is appointed by the moſt *conſummate wiſdom*——

Who ſees with equal eye, as God of all,
A hero periſh, or a ſparrow fall. POPE.

16. There is ſcarcely a *paſſion* that gives a warmer *glow* to the heart than *gratitude:* It is the foundation of every *duty* to God and man; but cannot dwell in *contracted* ſouls!

17. Kind and generous *actions* often meet with return, when long forgotten by the *doer*.

18. The *ill* tendency of *ſeverity* to youth, for little *faults*, ſtriking with *terror* their tender minds, is very obvious; as it puts them upon all kinds of ſhifts, or arts of evaſion, to prevent puniſhment: Thereby corrupting their native honeſty and ſimplicity; which ought, as a *firſt principle*, to be carefully cultivated and ſuccoured.

19. Prudence and patience are remedies for the deepeſt afflictions and diſtreſs.

20. As we *treat* others, we may one time or other expect to be *treated*.

21. The folly of the *hermetic* art, and of ſtretching life beyond its *uſual* date, is ridiculous, and contrary to good ſenſe.

22. What

22. What *folly* and *impiety* appear in ſome, who find fault with the *appointments* of infinite wiſdom! and would reform the *original* conſtitution of things!

23. *Mutual* dependance of ſtation is neceſſary to preſerve the *beauty*, *order*, and *well-being* of ſociety.

24. A *compaſſionate* action carries its own reward.

25. In the courſe of *providence*, occurrences, ſeemingly diſadvantageous to us, prove *greatly* beneficial in the event.

26. As we know not how we ſhould behave in a *different* ſtation, it teaches us to be *ſatisfied* with the ſtation allotted us.

27. Thoſe *reproofs* do the moſt *good*, given in the *leaſt* offenſive manner; when, by ſome diſtant *hint*, you make the *offender* his own accuſer.

28. As we cannot limit the *divine omnipotence*, ſo it is *fruitleſs* to buſy ourſelves in ſpeculations we can never clear.

29. All that is *neceſſary* for us to know of truth and duty, lies plain before us; and we can have no certain knowledge beyond our real *ideas*.

30. Mr. *Addiſon* obſerves in his *Spectator*, (a *library* of uſeful knowledge for both ſexes) that we are not, at preſent, in a ſituation to judge of the *counſels* by which *providence* acts, ſince but *little* arrives at our knowledge, and even that little we diſcern but imperfectly. And thoſe *events*, the *permiſſion* of which ſeems now to accuſe the divine goodneſs, may, in the *conſummation* of all things, both magnify his goodneſs and exalt his wiſdom.

31. Moral *good* and *evil* are ſeen to be productive of all the happineſs or miſery in the world.

32. So *erroneous* is human judgment, that granting our wiſhes would, ſometimes, be the greateſt *cruelty* done to us.

33. We behold different nations equally ardent in praying to heaven for each other's defeat or deſtruction; inſtead of reſigning the merit of their ſeparate *cauſes* into God's hands.

34. A *reliance* on divine providence, and aſcribing our ſucceſſes to God's power, is the only ſure way to engage his protection; and to gain that *firmneſs* of mind which nothing elſe can afford. For he, who holds the *univerſe* in dependance and exiſtence, can eaſily avert the moſt hidden *miſchief*; and, by *unforeſeen* cauſes, turn it upon the head of the contriver.

35. To him, who formed us all of one clay, it is ſeen in many inſtances that the life of the *meaneſt ſlave* has the ſame protection as that of the *greateſt hero*, and is as providentially guarded.

36. The wiſe author of nature has ſo ordered the conſtitution of the human mind, for the mutual happineſs and preſervation of the human ſpecies, that the *pure* joys of *natural* affection for our children give us a delight hardly to be equalled. How *greatly*, therefore, are thoſe their own enemies, who ſuffer their *vicious* paſſions to interrupt or *totally* deſtroy theſe ſolid enjoyments, and thoſe of friendſhip!

37. One crime, committed with impunity, leads to the commiſſion of a greater, till the hopes of *concealment* terminate in remorſe and puniſhment!

38. An overbearing and inſolent diſpoſition always deſerves and often meets with humbling circumſtances.

39. Happy is that *diſpoſition* which is brought to a juſt ſenſe of its own demerits.

40. We learn, from viſible inſtances, how great an injury thoſe parents do to their children, who bring them up in a way they are not likely to ſupport.

41. As we know not how ſoon a *reverſe* of fortune may ſet our inferiors above us, we ſhould learn from thence never to behave *diſdainfully* to any.

42. A *fixed* or *well-grounded eſteem* often riſes ſuperior to *ill-uſage*, and rejoices at an opportunity of ſhewing itſelf, when the conduct of an *ingrate* is altered.

43. An infinite diſproportion or difference is ſeen between a tyrant governed by his cruel jealouſies and raging paſſions, and a mind tempered with *wiſdom* and *benevolence*. The horrors of the one *illuſtrate*, by contraſt, the beauty and amiableneſs of the other!

44. The haughty *oppreſſor* is often dealt with deceitfully; his cruelty furniſhes his beſt friends with arts to evade his power.

45. Among well-inſtructed minds, we ſee *grandeur* make no part of real happineſs.

46. How dreadful a temptation is extreme poverty! but when innocently borne with reſolution and patience, is a happy ſtate, compared to any relief purchaſed by *guilt*, and the reproach of a bad conſcience.

47. What a commanding awe is *virtue* ſeen to have over the *vicious* heart, when it checks the fluſhed *libertine*, in the height of his promiſed pleaſure, from deſtroying *virgin* innocence!

48. He becomes a *victim* to repentance, and a *guardian* and *rewarder* of virtue, when he preſerves thoſe charms he was about to deſtroy!

49. From

49. From the *immorality* of ſervants, derived from *example* and *negligence* of maſters of families, flows that irreſiſtible torrent of *misfortunes* which ſpreads through all ranks of life.

50. Old age, by means of ill example and immorality, is oppreſſed with beggary; youth are drawn into the commitment of murders and robberies from the ſame evil cauſe.

51. If we conſider the happineſs which reſults from a fatherly conduct of maſters towards ſervants under their inſpection and notice, it would encourage every moral man to uſe his influence towards their well-doing, inſtead of exerciſing a *libertine* behaviour, ſo pernicious and frightful in its conſequences!

ON THE ADVANTAGES TO BE GAINED FROM ANY COMPANY.

1. AS the *bee* ſucks honey from every flower, (whether growing in the field, or in the garden,) from which the *ſpider* alſo *extracts* his poiſon; ſo a provident man, let his company be what it will, may gain advantage from it; while the indiſcreet and improvident man is worſted by moſt converſation.

2. Wiſe men improve themſelves from *contrary* qualities: for when *vice* beats up for recruits, as ſoon as her ugly form is diſcovered, inſtead of *enliſting*, ſhe frightens her *attendants*, who fly to *virtue's* ſtandard for refuge, and immediately take on in her corps.

3. Every man learns to correct his own faults by ſeeing how ugly thoſe *deformities* appear in others.

4. A *drunken* fellow, wallowing in a *kennel*, would make us believe, at firſt ſight, that *Circe* has transformed him into a *ſwine*; as the ſoldiers of *Ulyſſes*, in *Homer's* fables, were transformed, on a like occaſion: being a leſſon of inſtruction, in *Homer*, againſt ſuch beſtiality.

5. Choler, paſſion, and inſolent pride, by being ſeen, correct thoſe deformities in others.

6. Some have *imagined*, that cruel *commanders* will be tranſmigrated into *cart-horſes*, and whipped by *carmen* to their duty.

7. Some others have imagined, that the rich popiſh *clergy*, who fleece the poor and diſtreſſed, as well as the rich and opulent, *(preaching up charity, and doing none,)* will be tranſmigrated into beggars, to ſtroll the country for a livelihood.

8. Others

8. Others have imagined, that the great WHORE of *Babylon*, dreſſed in *ſcarlet*, will be tranſmigrated into a poor *ſtreet-walker*, and proſtitute herſelf to every mean *fellow* for a livelihood.

9. Others, again, have imagined, that the part of mankind, who proſtitute honeſt principles, for *gain* to themſelves, and to the diſadvantage of others, will be tranſmigrated into *robbers* of different degrees and denominations.

10. That *lawyers* will be tranſmigrated into falſe witneſſes; and that every one who has diſhonoured his *profeſſion*, will be tranſmigrated into a being of a *claſs* the moſt worthy of his demerits.

11. Reaſonable men mend by looking at *vice*; but *profligates* grow the worſe for the ſight.

12. As neither *example* nor *precept*, (except in matters of *religion*) can be an abſolute *guide* for any man's conduct, it muſt be an experienced and *practical* judgement, in the knowledge of men and things, that muſt direct him in the *doublings* and *turnings* of the world.

13. Since, in the ſtate of *man*'s life, events are caſual for the future, is it *impoſſible* that any man can leave to his *ſucceſſors* infallible rules to direct them, becauſe he knows not how times and things may alter.

14. In ſome things men will fall ſhort of thoſe who went before them; in others they will go beyond them: Such *imperfect* beings are men!

15. As the *induſtrious bee* gathers honey from different flowers, ſo (like men gathering fruit from all kinds of company) ſhe completes the compoſition, by *blending* together the *honey* gathered from ſeveral.

16. It requires care, in *converſation*, and choice of acquaintance, to diſtinguiſh the *real* and uſeful, from the *counterfeit* and worthleſs ſort. This is done by obſerving every good and bad *talent*, without diſlike or prejudice to any man.

17. As men cannot paſs through the world without meeting *vice* in their paſſage; ſo when they meet it, they ſhould make the beſt uſe of it; that they may avoid being intimate with, or infected by it.

18. The *example* of good ſociety may be improved to the doing ſome future good.

19. When we fall into *bad* company, we may from thence learn where the *rocks* lie that we are to ſhun.

20. As

20. As the *mariner* makes every *wind* ſerve him, for ſailing towards his intended *port*, even amidſt *dangers*, *difficulties*, and *currents*, when he has ſea-room; ſo a *prudent* man will navigate himſelf into the harbour of ſafety and happineſs in any company.

21. As *embaſſadors* from foreign ſtates avail themſelves of all *advantages* they are ſent to take, ſo *mankind*, ſent hither to avail themſelves of the happineſs of a future ſtate, ſhould gain as much empire on that dominion as they can: who, like the *phyſicians*, by correcting *poiſon*, ſhould make it medicable for the mind's health; which of its own nature, and without ſuch neceſſary correction, is *deſtructive* to the human being.

22. The *imperfections* and *depravities* of the preſent *human* ſtate, with all the different modes of pleaſure and pain conſidered, are ſuch, that the *beſt* and wiſeſt human being may, with reaſon, wiſh for a tranſlation from this to ſome other orb, or ſituation of being, among the *innumerable worlds*, revolving in *infinite* ſpace, either viſible or remote from ſight; in hopes that there is ſome ſtate amongſt them to be found, of more *ſubſtantial* and permanent happineſs than what, from experience can be enjoyed upon this our contracted ſpot of earth.

23. If the *multiplication* of our faculties of perception, and the enlargement of our *underſtanding*, connected with a *ſubſtance* fitted for ſuch a change, (not affected by *hunger*, *thirſt*, *heat*, *cold*, *pain*, &c.) could once become our privilege, without a poſſibility of a future death, or a falling from that ſtate but ſtill advancing towards perfection, to what a pitch of happineſs (O INFINITE and SACRED CREATOR!) ſhall we then attain.

CHANGE OF ACQUAINTANCE.

BY OBSERVATOR.

1. ACQUAINTANCE, or *friendſhip*, is diſſolved, like a broken *league*, or a cloud by the winds, when the conditions are forfeited.

2. Acquaintance, founded on ſelf-intereſt and ſelfiſh views, changes with advantage, and *new* proſpects.

3. The *aggreſſor*, in acquaintance or friendſhip, firſt breaks the *ties*.

4. There is no right of future acquaintance founded in the *cuſtom* of preſent intimacy.

5. Choice,

5. Choice, or liberty, will warrant an alteration in friendſhip, or acquaintance, on a ſufficient cauſe aſſigned.

6. Eſteem is forfeited in friendſhip, as well as in *love*.

7. *Gratitude*, entailed by a generous *benefactor*, ſhould be acknowledged as a *debt* due, (though never diſcharged) for the weighty obligations received.

8. To forbid *gratitude* is to forbid humanity and duty.

9. *Praiſe* for a ſmall accompliſhment is often founded on fear, is a *tribute* of flattery, and, at *beſt*, to be ſuſpected of *ſincerity*, when *actions* do not concur to prove the heart.

RULES FOUND IN THE STUDY OF A PERIODICAL AUTHOR.

1. SELECT the beſt things, and improve what is uſeful.
2. Reject immoral and indecent ſubjects.
3. Promote *truth*, and ſuppreſs error.
4. Determine *place* of connexion.
5. Extract truth from the *droſs* of words, ſcattered in a multitude of books; as *gold* is ſelected and refined from its *ore*, ſcattered abroad in the *mines*.
6. Truth is *ſmothered* by many, but made conſpicuous by *few* and expreſſive words.
7. Eloquence (by *metaphor*, *ſimilitude*, and *alluſion*) ſtrikes like a likeneſs in a glaſs.
8. Falſe metaphor and alluſion is ſimilar to painting in diſproportion; or to giving a wrong likeneſs.
9. The *ornaments* of language ſhould be ſtriking, while they convey a ſtrong likeneſs of the thing, or things, repreſented.
10. Never ſacrifice *truth* to prejudice.
11. Do no *injuſtice*.
12. Treat an *open* enemy with generoſity; but a treacherous and concealed one as he deſerves.
13. Moral *rules* and *maxims*, drawn from experience, will direct men to the port of happineſs, as ſhips are guided through a tempeſtuous ocean to a ſafe harbour, by the plain and ſure rules of *navigation*.

ADDRESS

ADDRESS TO BRITISH YOUTH AT SCHOOL.

PALLAS and *Prudence* all your ſteps ſhould guide,
And ſtill from *Meanneſs* ever turn aſide
Though *Underſtanding* marks the youth and man,
If you're not as you would, be *what you can.*
Good habits are by cuſtom ſoon acquir'd:
The *bad* are hated, and the *good* admir'd.

THE DUTY OF MAN INFERRED FROM THE WORKS OF CREATION; OR NATURAL RELIGION DELINEATED.

CONTEMPLATING the *infinite* variety and grandeur of the *works* of creation, eſpecially thoſe *works* which come moſt under our obſervation, that concern the *ſciences* to know, will the moſt exalt our *ideas* of the Creator's *greatneſs* and goodneſs; and the moſt *excite* our gratitude and homage to the *author* of all things, for the powers, faculties, and benefits we enjoy. To *underſtand* which, is the proper ſubject of moral philoſophy, and of human happineſs. In the dependance, connexion, ſcheme, union, harmony, and preſervation of the works of creation is manifeſted the duty of man, in reſpect to the *Creator* of all things, and the *individuals* of ſociety.

MEN, like the *plants*, firſt received their being upon this ſpot of earth, whence they firſt knew ſenſation, perception, memory, reflection, reaſon, and judgement, and all that their faculties comprehend. Who were here firſt conſcious of their exalted ſtations above all other created animals, were likewiſe made conſcious of their power to do good or evil, in reſpect to each other's pleaſure or pain. Whence it is *inferred*, that men were created as *inſtruments* or agents of the *divine* Providence, to obey his will, and execute the purpoſes of *creation*, according to the laws of civil government, (dictated and inſpired by God,) under which they are placed; by that *divine Providence* evidently preſiding and ruling over kings and kingdoms.

MEN, it appears, were created in high and low ſubordination, under the divine power and influence, and the direction of one another, to act in mutual concert for each other's dependance

and

and a *Chriſtian*, and of parents, by an early education, to perform.

FROM *Nature's* chain whatever *link* you ſtrike,
Tenth or ten thouſandth break the chain alike.
Aſpiring to be Gods, if Angels fell,
Aſpiring to be Angels, men rebel:
And who but wiſhes to invert the laws
Of order, ſins againſt th' eternal cauſe.

POPE'S ETHICS.

END OF THE FIRST PART.

CURIOUS RECREATIONS.

PART II.

Previous to these Recreations with the Cards, it will be necessary to explain the Method of making the Pass: That is, bringing a certain number of cards from the Bottom of the Pack to the Top: as many of these Recreations depend on that Manœuvre.

HOLD the pack of cards in your right hand, so that the palm of your hand may be under the cards; place the thumb of that hand on one side of the pack, the first, second, and third fingers on the other side, and your little finger between those cards that are to be brought to the top, and the rest of the pack. Then place your left hand over the cards, in such manner, that the thumb may be at C, (Pl. I. Fig. 1, and 2.) the fore finger at A, and the other fingers at B.

THE hands and the two parts of the cards being thus disposed, you draw off the lower cards confined by the little finger and the other parts of the right hand, and place them, with an imperceptible motion, on the top of the pack.

IT is quite necessary, before you attempt any of the recreations that depend on making the pass, that you can perform

it ſo dextrouſly that the eye cannot diſtinguiſh the motion of your hand; otherwiſe, inſtead of deceiving others, you will expoſe yourſelf. It is alſo proper that the cards make no noiſe, as that will occaſion ſuſpicion. This dexterity is not to be attained without ſome practice.

It will be neceſſary in ſeveral of the following recreations to have a pack of cards, including one or more that are a ſmall matter longer or wider than the reſt; a proper method of preparing which will be given in the courſe of theſe recreations.

The Card of Divination.

HAVE a pack in which there is a long card; open the pack at that part where the long card is, and preſent the pack to a perſon in ſuch manner that he will naturally draw that card. He is then to put it into any part of the pack, and ſhuffle the cards. You take the pack and offer the ſame card in like manner to a ſecond or third perſon; obſerving, however, that they do not ſtand near enough to ſee the card each other draws. You then draw ſeveral cards yourſelf, among which is the long card, and aſk each of the parties if his card be among thoſe cards, and he will naturally ſay yes, as they have all drawn the ſame card. You then ſhuffle all the cards together, and cutting them at the long card, you hold it before the firſt perſon, ſo that the others may not ſee it, and tell him that it is his card. You then put it again in the pack, and ſhuffling them a ſecond time, you cut again at the ſame card, and hold it in like manner to the ſecond perſon, and ſo of the reſt.

If the firſt perſon ſhould not draw the long card, each of the parties muſt draw different cards; when cutting the pack at the long card, you put thoſe they have drawn over it, and ſeeming to ſhuffle the cards indiſcriminately, you cut them again at the long card, and ſhew one of them his card. You then ſhuffle and cut in the ſame manner, and ſhew another perſon his card, and ſo on: remembering that the card drawn off by the laſt perſon is the firſt next the long card; and ſo of the reſt.

This recreation may be performed without the long card, in the following manner. Let a perſon draw any card whatever, and replace it in the pack; you then make the paſs, and bring that card to the top of the pack, and ſhuffle them without loſing ſight of that card. You then offer that card to a

ſecond

ſecond perſon, that he may draw it, and put it in the middle of the pack. You make the paſs and ſhuffle the cards a ſecond time in the ſame manner, and offer the card to a third perſon, and ſo again to a fourth or fifth, as is more fully explained further on.

THERE is frequently exhibited another experiment, ſimilar to this, which is by making a perſon draw the long card, then giving him the pack, you tell him to place his card where he pleaſes, and ſhuffle them, and you will then name his card, or cut the pack where it is. You may alſo tell him to put the pack in his pocket, and you will draw the card, which you may eaſily do by the touch.

The four confederate Cards.

LET a perſon draw any four cards from the pack, and tell him to think on one of them. When he returns you the four cards you dextrouſly place two of them under the pack and two on the top. Under thoſe at the bottom you place four cards of any ſort, and then taking eight or ten from the bottom cards, you ſpread them on the table, and aſk the perſon if the card he fixed on be among them. If he ſay *no*, you are ſure it is one of the two cards on the top. You then paſs thoſe two cards to the bottom, and drawing off the loweſt of them, you aſk if that is not his card. If he again ſay *no*, you take that card up, and bid him draw his card from the bottom of the pack.

IF the perſon ſays his card is among thoſe you firſt drew from the bottom, you muſt dextrouſly take the four cards that you put under them, and placing them on the top, let the other two be the bottom cards of the pack, which you are to draw in the manner before deſcribed.

The Numerical Card.

LET the long card be the ſixteenth in a pack of piquet cards. Take ten or twelve cards from the top of the pack, and ſpreading them on the table deſire a perſon to think of any one of them, and to obſerve the number it is from the firſt card. Make the paſs at the long card, which will then be at the bottom. Then aſk the party the number of his card, and count to yourſelf from that number to 16, turning the cards up one by one from the bottom. Then ſtop, at the ſeventeenth card, and aſk the perſon if he has ſeen his card, when

he will ſay *no*. You then aſk how many more cards you ſhall draw before his card appears; and when he has named the number, you draw the card aſide with your finger, and turn up the number of cards he propoſed, and then throw down the card he fixed on.

Divination by the Sword.

AFTER a card has been drawn you place it under the long card, and by ſhuffling them dextrouſly you bring it to the top of the pack. Then lay, or throw, the pack on the ground, obſerving where the top card lays. A handkerchief is then bound over your eyes, in ſuch manner however that you can ſee the ground, which may be eaſily done. A ſword is then put into your hand, with which you touch ſeveral of the cards, ſeemingly in great doubt, but never loſing ſight of the top card, in which at laſt you fix the point of the ſword, and preſent it to him who drew it. Two or three cards may be diſcovered in the ſame manner, that is, by placing them under the long card, and then bringing them to the top of the pack.

The Card thought on per force.

YOU part a pack of cards before a perſon, in ſuch manner that one of the pictured cards only is completely viſible. You then tell him to think on one of thoſe cards, obſerving attentively if he fix his eye on the pictured card. When he ſays he has determined, you ſhuffle the cards, and turning them up, one by one, you tell him, That is his card.

IF he does not appear to fix his eye on the pictured card, or if he ſpread the cards in order to fix upon another, you tell him to draw the card he chooſes, and then by placing it under the long card you perform ſome other recreation. It is eaſy to conceive that this recreation may fail, and that it ſhould not be attempted with thoſe who are converſant with deceptions of this ſort.

The tranſmutable Cards.

YOU muſt have in the pack two cards of the ſame ſort, ſuppoſe the king of ſpades. One of theſe is to be placed next the bottom card, which may be the ſeven of hearts, or any other card. The other is to be placed at top. You then ſhuffle the cards, without diſplacing thoſe three cards, and ſhew a perſon that the bottom card is the ſeven of hearts.

Then

Then drawing that card privately aſide with your finger, which you have wetted for that purpoſe, you take the king of ſpades from the bottom, which the perſon ſuppoſes to be the ſeven of hearts, and lay it on the table, telling him to cover it with his hand. You then ſhuffle the cards again, without diſplacing the firſt and laſt card, and paſſing the other king of ſpades at the top to the bottom, you ſhew it to another perſon. You then draw that privately away, and taking the bottom card, which will then be the ſeven of hearts, you lay that on the table, and tell the ſecond perſon, who believes it to be the king of ſpades, to cover it with his hand.

You then command the ſeven of hearts, which is ſuppoſed to be under the hand of the firſt perſon, to change into the king of ſpades; and the king of ſpades, which is ſuppoſed to be under the hand of the ſecond perſon, to change into the ſeven of hearts; and when the two parties take their hands off, and turn up the cards, they will ſee, to their no ſmall aſtoniſhment, after having ſo carefully obſerved the bottom card, that your commands are punctually obeyed.

The Three Magical Parties.

YOU are to offer the long card to any one, that he may draw it, and place it again in any part of the pack he thinks proper. You then make the paſs, and bring that card to the top of the pack. You next divide the pack into three heaps, obſerving to put the long card in the middle heap, as that is moſt commonly choſen. You then demand of the perſon which of the heaps the card he drew ſhall be in. If he reply in the middle parcel, you immediately ſhew him the card. But if he ſays in either of the others, you take all the cards in your hand, placing the parcel he has named over the other two, obſerving to put your little finger between that and the middle heap, at the top of which is the card he drew. You then aſk at what number in that heap he will have his card appear. If he ſays, for example, the ſixth card, you tell down five cards from the top of the pack, and then dextrouſly making the paſs, you bring the long card to the top, and tell it down as the ſixth.

The Inverted Cards.

PREPARE a pack of cards, by cutting one end of them about one-tenth of an inch narrower than the other; then offer the

the pack to any one that he may draw a card; place the pack upon the table, and obſerve carefully if he turn the card while he is looking at it: if he do not, when you take the pack from the table, you offer the other end of it for him to inſert that card; but if he turn the card, you then offer him the ſame end of the pack. You afterwards offer the cards to a ſecond or third perſon, for them to draw and replace a card in the ſame manner. You then let any one ſhuffle the cards and taking them again in your own hand, as you turn them up one by one, you eaſily perceive by the touch which thoſe cards are that have been inverted, and laying the firſt of them down on the table, you aſk the perſon if that card be his; if he ſay *no*, you aſk the ſame of the ſecond perſon, and if he ſay *no*, you tell the third perſon it is his card; and ſo of the ſecond and third cards. You ſhould lay the pack on the table after each perſon has drawn his card, and turn it dextrouſly in taking it up, when it is to be turned, that the experiment may not appear to depend on the cards being inverted.

The Card diſcovered by the Touch or Smell.

YOU offer the long card, or any other that you know, and as the perſon who has drawn it holds it in his hand, you pretend to feel the pips or figure on the under ſide by your fore finger; or you ſagaciouſly ſmell to it, and then pronounce what card it is.

If it be the long card, you may give the pack to the perſon who drew it, and leave him at liberty either to replace it, or not. Then taking the pack, you feel immediately whether it be there or not, and ſhuffling the cards in a careleſs manner, without looking at them, you pronounce accordingly.

The incomprehenſible Tranſpoſition.

TAKE a card, the ſame as your long card, and rolling it up very cloſe, put it in an egg, by making a hole as ſmall as poſſible, and which you are to fill up carefully with white wax. You then offer the long card to be drawn, and when it is replaced in the pack you ſhuffle the cards ſeveral times, giving the egg to the perſon who drew the card, and while he is breaking it, you privately withdraw the long card, that it may appear, upon examining the cards, to have gone from the pack into the egg. This recreation may be rendered more ſurpriſing by having ſeveral eggs, in each of which is placed a card of the

the ſame ſort, and then giving the perſon the liberty to chooſe which egg he thinks fit.

THIS deception may be ſtill further diverſified, by having, as moſt public performers have, a confederate, who is previouſly to know the egg in which the card is placed; for you may then break the other eggs, and ſhew that the only one that contains a card is that in which you directed it to be.

The Card in the Pocket-book.

THIS recreation is to be performed by a confederate, who is previouſly to know the card you have taken from the pack and put in your pocket-book. You then preſent the pack to your confederate, and deſire him to fix on a card, (which we will ſuppoſe to be the queen of diamonds) and then place the pack on the table. You then aſk him the name of the card, and when he ſays the queen of diamonds, you aſk him if he be not miſtaken, and if he be ſure that card is in the pack: when he replies in the affirmative, you ſay, it might be there when you looked over the cards, but I believe it is now in my pocket: then deſire a third perſon to put his hand in your pocket, and take out your book, and when it is opened the card will appear.

EXPERIMENTS of this kind appear as wonderful to thoſe who have no idea of a confederacy, as they do ſimple and trifling to thoſe that are in the ſecret.

To tell the Card that a Perſon has only touched with his Finger.

THIS recreation alſo is to be performed by confederacy. You previouſly agree with your confederate on certain ſigns, by which he is to denote the ſuit, and the particular card of each ſuit, as thus: if he touch the firſt button of his coat, it ſignifies an ace; if the ſecond, a king, &c. and then again if he takes out his handkerchief, it denotes the ſuit to be hearts; if he takes ſnuff, diamonds, &c. Theſe preliminaries being ſettled, you give the pack to a perſon who is near your confederate, and tell him to ſeparate any one card from the reſt, while you are abſent, and draw his finger once over it. He is then to return you the pack, and while you are ſhuffling the cards, you carefully note the ſignals made by your confederate. Then turning the cards over one by one, you directly fix on he card he touched.

To

To name ſeveral Cards that two Perſons have drawn from the Pack.

DIVIDE a piquet pack of cards into two parts by a long card. Let the firſt part contain a quint to a king in clubs and ſpades, the four eights, the ten of diamonds and ten of hearts; and let the other part contain the two quart majors in hearts and diamonds, the four ſevens and the four nines.—The cards may be divided in any other manner that is eaſy to be remembered.

THEN ſhuffle the cards, but be careful not to diſplace any of thoſe cards of the laſt part which are under the long card. You then cut at that card, and leave the pack in two parts. Next, preſent the firſt of thoſe parts to a perſon, and tell him to draw two or three cards, and place the remainder on the table. You preſent the ſecond parcel in like manner to another. Then having dextrouſly placed the cards drawn by the firſt perſon, in the ſecond parcel, and thoſe drawn by the ſecond perſon in the firſt parcel, you ſhuffle the cards, obſerving not to diſplace any but the upper cards. Then ſpreading the cards on the table, you name thoſe that each perſon drew; which you may very eaſily do, by obſerving the cards that are changed in each parcel.

The two Convertible Aces.

ON the ace of ſpades fix with ſoap, a heart, and on the ace of hearts a ſpade, in ſuch manner that they will eaſily ſlip off.

SHEW theſe two aces to the company; then taking the ace of ſpades, you deſire a perſon to put his foot upon it, and as you place it on the ground, draw away the ſpade. In like manner you place the ſeeming ace of hearts under the foot of another perſon. You then command the two cards to change their places; and that they obey your command, the two perſons on taking up their cards, will have ocular demonſtration.

A DECEPTION ſimilar to this is ſometimes practiſed with one card. ſuppoſe the ace of ſpades, over which a heart is paſted ſlightly. After ſhewing a perſon the card you let him hold one end of it, and you hold the other, and while you amuſe him with diſcourſe you ſlide off the heart. Then laying the card on the table you bid him cover it with his hand. You then knock under the table, and command the heart to turn

turn into the ace of ſpades. By deceptions like theſe, people of little experience and much conceit are frequently deprived of their money, and rendered ridiculous.

To ſhuffle Cards in ſuch a manner as always to keep one certain Card at the Bottom.

A PERSON with a hard hand and ſtiff joints ſhould never think of playing deceptions with the cards, as clumſy fingers will not do. In ſhewing tricks with cards, the principal point conſiſts in ſhuffling them nimbly, and yet keeping one certain card, either at the bottom or in ſome known place of the pack, four or five cards from the bottom; for by this you may ſeem to work wonders, ſince it is eaſy for you to ſee, or take notice of a card; which though you are perceived to do, it will not be ſuſpected if you ſhuffle them well together, afterwards, by the method here taught, which is this: in ſhuffling let the bottom card be always kept a little before, or, which is beſt, a little behind all the reſt of the cards; put it a little beyond the reſt before, right over your fore-finger, or elſe, which is the beſt, a little behind the reſt, ſo that the little finger of the left hand may ſlip up, and meet with it; at the firſt ſhuffle as thick as you can, and at laſt, throw upon the board the bottom card, with as many more as you would preſerve for any purpoſe, a little before or a little behind the reſt; and be ſure to let your fore finger, (if the pack be laid before) or your little finger, (if the pack be laid behind) always creep up to meet with the bottom card, and when you feel it, you may there hold it till you have ſhuffled over again, which being done, the card which was firſt at the bottom will come there again; thus you may ſhuffle them before their faces, and yet leave your noted card at the bottom; you muſt try to be very perfect in this method of ſhuffling; and having once attained it, you may do almoſt what you pleaſe; for whatever pack you make, though it is ten, twelve, or twenty cards, you may ſtill keep it next the bottom, and yet ſhuffle them often, to pleaſe the curious.

To call for any Card in the Pack.

THIS trick, which requires very little practice or indeed underſtanding, to perform, is done in the following manner:

HAVING privately ſeen a card, put it at the bottom of the pack, then ſhuffle the cards till it comes to the bottom again, then

then put the cards behind you; and ſay here I call for, naming the bottom card, which you have ſeen; and as you hold them behind you, turn the top card with its face upwards, then hold forth the cards, and as you hold them you may ſee what the next card is; then put the cards behind you again, and take the top card, and put it at the bottom, with its face downwards, and turn the next card with its face upwards; and whilſt you are doing this, ſay, here I call for, naming the card you ſaw laſt; then hold forth the cards again, ſhewing the bottom card, which will be that you call for; then put the cards behind you again, and proceed in the ſame manner as you did before; you may by this method go through them all, and call for all the cards in the pack, to the admiration of the beholders, who will be ſurpriſed how you could find them out when you hold them behind you.

How to make a Card jump out of the Pack and run on the Table.

TAKE a pack of cards, and let any one draw any card that they fancy beſt, and afterwards take and put it into the pack, but ſo that you may know where to find it at pleaſure; for by this time I ſuppoſe you know how to ſhuffle the cards, and where to find any card when it is put into the pack; then take a piece of wax and put it under the thumb-nail of your right hand, and there faſten a hair to your thumb, and the other end of the hair to the card; then ſpread the pack of cards open on the table: then ſay, *If you are a pure virgin the card will jump out of the pack*; then by your words or charms ſeem to make it jump on the table.

How to tell what Card any Man thinketh on, and how to convey the ſame into a Kernel of a Nut or Cherry-ſtone, and the ſame again in one's Pocket; and how to make him draw the ſame, or any Card you pleaſe, and all under one Device.

TAKE a nut, or cherry-ſtone, and burn a hole through the ſide of the top of the ſhell, and alſo through the kernel if you will, with a hot bodkin, or bore it with an awl, and with a needle pull out the kernel, ſo as the ſame may be as wide as the hole of the ſhell; then write the name of the card on a piece of fine paper, and roll it up hard, then put it into the nut or cherry-ſtone, and ſtop the hole up with wax, and rub the ſame over with a little duſt, and it will not be perceived: then let ſome ſtander-by draw a card, ſaying, *It is no matter what*

what card you draw: and if your hands ſo ſerve you to uſe the card well, you ſhall proffer him, and he ſhall receive the ſame card that you have rolled up in the nut; then take another nut and fill it up with ink, and then ſtop the hole up with wax, and then give that nut which is filled with ink to ſome boy to crack, and when he finds the ink come out of his mouth, it will cauſe great laughter. By this feat on the cards, many wonders may be done.

How to let twenty Gentlemen draw twenty Cards, and to make one Card every Man's Card.

TAKE a pack of cards, let any gentleman draw a card, and let him put it in the pack again, but be you ſure that you know where to find it again at pleaſure; then ſhuffle the cards again as you are taught before, and then let another gentleman draw a card, but be ſure that you let him draw no other but the ſame card as the other did draw; and ſo till 10 or 12, or as many cards as you think fit: when you have ſo done, let another gentleman draw another card, but not the ſame, and put the card into the pack where you have kept the other card, and ſhuffle them till you have brought both the cards together; then ſhewing the laſt card to the company, the other will ſhew the trick. By this means many other feats may been done.

How to change a Pack of Cards into all manner of Pictures.

YOU muſt take a pack of cards, and paint upon the back-ſide of one half of the pack, what manner of figures ſhall pleaſe your fancy beſt; as men, women, birds, flowers, &c. Then paint the other half of the cards, viz. on that ſide where the ſpots are on, after the ſame manner you did the other half; ſo between them both you will have a compleat pack of all pictures: and when you will perform this trick, you muſt ſhew the cards but half-way. This is one of the beſt tricks on the cards.

To make the Conſtable catch the Knave.

TAKE a pack of cards, and look out the four knaves; lay one of them privately on the top of the pack, and lay the other three down upon the table, ſaying, *Here you ſee are three Knaves got together, about no good you may be ſure.* Then lay down a king beſide them, ſaying, *But here comes the conſtable, and catches them*

together: Oh, (ſays he) *have I caught you together? Well, the next time I catch you together, I'll puniſh you ſeverely for all your roguieries. Oh, but* (ſay they) *you ſhan't catch us together in haſte:* for they conclude to run three ſeveral ways. *Well, I'll go here,* (ſays one) ſo take one of the knaves and put him at the top of the pack; *And I'll go here,* (ſays another) ſo put him at the bottom: *Then I'll go here,* (ſays the third) ſo put him in the middle. *Nay,* (ſays the conſtable) *if you run I'll make ſure of one, ſo I'll follow the firſt:* then take the king and put him at the top, and let any one cut the cards aſunder two or three times, then deal out the cards one by one, and you ſhall find the three knaves together, and the conſtable with them.

Note, This feat would be beſt done with a pack of cards that has two knaves of that ſort of which you put one in the middle.

How to make a Card jump out of an Egg.

TO do this wonderful feat you muſt have two ſticks made of a ſize, and both of a likeneſs, ſo that no perſon can know one from the other; one of theſe ſticks muſt be made ſo artificially as to conceal a card in the middle, as thus: you muſt have one of your ſticks turned hollow quite through, and then an artificial ſpring to throw the card in the egg at your pleaſure. The operation is thus: take and peal any card in the pack, which you pleaſe, and ſo roll it up, and then put it into your falſe ſtick, and there let it be till you have occaſion to make uſe of it; then take a pack of cards, and let any one draw a card, but be ſure let it be the ſame ſort of card that you have in the ſtick already; then let them put it in the pack again, and when you have ſhuffled them, let that card fall into your lap which the party drew: ſo calling for ſome eggs, deſire the party that drew the card, or any other perſon in the company, to chuſe any one of theſe eggs, and when they have choſen one, aſk them if there be any thing in it, and they will anſwer No: then take the egg in your left hand, and the falſe ſtick in your right, and ſo break the egg with your ſtick; then let the ſpring go, and the card will appear in the egg, to the amazement of the beholders! then conceal that ſtick, and produce the true one upon the table.

For

For a Perſon to chuſe a Card, you being ſuppoſed not to know what it is, and then for the Perſon to hold the Cards between his Finger and Thumb, to ſtrike them all out of his Hand, except the very Card he had taken.

THIS is called the Nerve trick, and is thus performed; having previouſly looked at a card, bid the perſon draw one, taking care to ſhove that to him which you know; when he has looked at it, let him put it at the bottom; let him ſhuffle the cards, then you look at them again, and finding the card, place it at the bottom; then cut them in half; give the party that part which contains his choſen card at the bottom, to hold between his finger and thumb juſt at the corner; bid him pinch them as tight as he can; then ſtriking them pretty ſharp, they will all fall to the ground, except the bottom one, which is the card he had choſen.

THIS is a very curious trick, and if cleanly done, is really aſtoniſhing; but may be accounted for from the nature of the nerves, which are always more retentive when any thing is attempted to be taken either by force or ſurpriſe.

To tell what Card a Perſon thinks upon, though you are not in the Room, or which Card he has touched, or waved his Hand over.

TO do this trick you muſt lay a wager that you will tell the card the perſon has touched, though you do not ſee it: Let ſeveral cards be laid out on a table, 1, 2, 3, 4, 5, 6, or any number, then turn your back, or leave the room while the perſon makes choice; on your return you muſt inquire what he will lay, having your eye upon the cards laid out; if he ſays he will lay ſix to one, or ten to one, you muſt take the higheſt number, as that will, in all probability, be the card he had fixed on. You muſt ſeem to pauſe about counting the cards as they lay, and chooſing the fartheſt off.

How to deliver out Four Aces, and convert them to Four Knaves.

THIS trick is one among the many which is effected by a quick ſlight; for if it is done in a bungling manner, it may eaſily be detected, and the pretender will be liable to contempt inſtead of applauſe.

To do this, make a pack of eight cards, viz. four aces and four knaves, and let them be laid in this order: an ace and a

knave, and ſo alternately through all the eight cards; then ſhuffle them, ſo as always at the ſecond ſhuffling, or at leaſt when you have done ſhuffling them, one of the aces may be the nethermoſt card; then uſe ſome words or device, and putting your hand with the cards to the edge of the table, let out privately a piece of the ſecond card, which is one of the knaves; then ſhewing to the ſtanders-by the nether card, which is one of the aces; be ſure to cover the piece of the knave with your fingers; then draw out the ſame knave, laying it down on the table; then ſhuffle the cards as before, and you will have two aces at bottom; therefore take off the uppermoſt card, and thruſt it into the middle of the pack; do the ſame with the nethermoſt card, which is one of the aces, then you may ſhew another ace as before; and inſtead of that lay down another knave; proceed in the ſame method, till, inſtead of the four aces, you have laid down the four knaves.

THE beholders, all the time thinking that they lay four aces on the table, are greatly deceived when the cards are turned up, and will wonder at the transformation.

To tell what Card a Perſon pitches on, without ſeeing the Card till you find it in the Pack.

THE many different tricks which may be done with cards muſt have been invented by various perſons, at different periods, as it cannot be ſuppoſed that any one perſon could be the inventor of all. This trick is done in the following manner: as you hold the cards in your hand, let any one take a card out of the pack, and look at it; then take the card from them with your eyes ſhut, and put it at the bottom of the pack; then ſhuffle the cards till you know it is come to the bottom again: then putting the cards behind you, pretend to ſhuffle them behind you, but let your ſhuffling be only this; take off the uppermoſt card, and put it at the bottom, reckon that two: then take off another card, and reckon that three; then take off as many as you pleaſe from the top, and put them at the bottom, counting to yourſelf how many you take off: then bring the cards forth, and hold them with their faces towards you; then take off one by one, privately counting the number, and ſmell to them, as though you found it out by your noſe, till you come to the right card; then produce it, ſaying, this is it; and they will wonder how you found it out.

A LITTLE practice will serve to perfect any perſon in this trick, and indeed moſt of them depend on practice, as well as other manual operations.

To diſcover the Number of Points on three Cards, placed under three different Parcels of Cards.

YOU are firſt to agree that the ace ſhall tell eleven, the pictured cards ten each, and the others according to their number of points; as at the game of piquet. Then propoſe to any one to chooſe 3 cards, and over each of them to put as many cards as will make the number of the points of that card 15. Suppoſe, for example, he chooſes a 7, a 10, and an ace: then over the 7 he muſt place eight cards: over the 10, five cards: and over the ace, four. Take the remainder of the cards, and ſeeming to look for ſome card among them, tell how many there are, and adding 16 to that number, you will have the number of points on the three cards. As in this inſtance, where there will remain 12 cards, if you add 16 to that number it will make 28, which is the number of points on the three cards*.

The Ten Duplicates.

TAKE twenty cards, and after any one has ſhuffled them, lay them down by pairs on the board, without looking at them. Then deſire ſeveral perſons to look each of them at different pairs, and remember what cards compoſe them. You then take up all the cards, in the order they lay, and place them again on the table, according to the order of the letters in the following words.

M	U	T	U	S
1	2	3	4	5
D	E	D	I	T
6	7	8	9	10
N	O	M	E	N
11	12	13	14	15
C	O	C	I	S†
16	17	18	19	20

Now

* If this recreation be performed with a pack of quadrille cards, the number added to the remaining cards muſt be eight.

† These words convey no meaning. The laſt word is ſometimes wrote Coecis; but that being no Latin word, can make no ſenſe with the others. If, indeed, it was Cæcis, a ſort of ſenſe might be made out; but then the æ would by no means anſwer the o in Nomen, as it muſt do to perform the recreation.

Now you will obſerve that theſe words contain ten letters repeated, or ten pair of letters. Therefore you aſk each perſon which row, or rows, the cards he looked at are in; if he ſays they are in the firſt row, you know that they muſt be the ſecond and fourth; if in the ſecond and fourth rows, they muſt be the ninth and nineteeth, and ſo of the reſt.

To name the Number of Cards that a Perſon ſhall take out of the Pack.

TO perform this recreation you muſt ſo diſpoſe a piquet pack of cards, that you can eaſily remember the order in which they are placed. Suppoſe for example, that they are placed according to the words in the following line;

Seven aces, eight kings, nine queens, and ten knaves.

And that every card be of a different ſuit, following each other in this order; ſpades, clubs, hearts, and diamonds. Then the eight firſt cards will be the ſeven of ſpades, ace of clubs, eight of hearts, king of diamonds, nine of ſpades, queen of clubs, ten of hearts, and knave of diamonds; and ſo of the reſt*.

You ſhow that the cards are placed promiſcuouſly, and then offer them with the backs upward, to any one, that he may draw what quantity he pleaſes; which when he has done, you dexterouſly look at the card that precedes, and that which follows thoſe he has taken. After he has well regarded the cards, you take them from him, and putting them into different parts of the pack, ſhuffle them, or give them to him to ſhuffle. During which you recollect, by the foregoing line all the cards he took out, and as you lay them down, one by one, you name each card.

THIS is a pleaſing recreation for thoſe that have a good memory; they that have not, ſhould never attempt it.

A Century of different Names being wrote on the Cards, to tell the particular Name which any Perſon has thought on†.

ON ten cards write a hundred different names, obſerving only, that the laſt name on each card begins with one of the letters

* This recreation may be farther diverſified, by placing the cards in ſuch manner, by the table for thirty-two numbers, that after they have been ſhuffled once or twice, they may come into the above order.

† This is called the Impenetrable Secret.

letters of the word INDROMACUS, which letters, in the order they ſtand, anſwer to the numbers 1, 2, 3, &c. to 10. On ten other cards write the ſame names, with this reſtriction, that the firſt name on every card muſt be taken from the firſt of the other cards, whoſe laſt name begins with I: the ſecond name muſt be taken from that whoſe laſt name begins with N; and ſo of the reſt. Then let any one chooſe a card out of the firſt ten, and after he has fixed on a name give it you again, when you carefully note the laſt name, by which you know the number of that card. You then take the other ten cards, and after ſhuffling them, ſhew them to the perſon one by one, and aſk if he ſees the name he choſe, and when he ſays he does, you look to that name which is the ſame in number from the top, with the number of the card he took from the other parcel, and that will be the name he fixed on. As for example, ſuppoſe he took out the card that had the word Daphnis at the bottom, which is the third card, and that he fixed on the name Galatea, then that would neceſſarily be the third on the other card.

Order

Order of the Words on the first Ten Cards.

First Card	*Second*	*Third*	*Fourth*
Celadon	Pomona	Deucalion	Licas
Andromeda	Omphalus	Heſiona	Calypſo
Silenus	Ariadne	Galatea	Medea
Acis	Liſis	Thetis	Adonis
Eglea	Flora	Atys	Ceres
Sirincus	Danae	Palamedes	Caſſandra
Thyrſis	Alçander	Melibæus	Pales
Polyphemus	Tireſias	Orion	Menelaus
Proteus	Iſſoria	Niſus	Glaucus
Jaſon	Narciſſus	Daphnis	Rophelina

Fifth	*Sixth*	*Seventh*	*Eighth.*
Latona	Icarus	Ganymede	Leander
Hilas	Clitander	Ariſtea	Peleus
Thiſbe	Alcinous	Hyacinthus	Caliſta
Diana	Endimion	Circe	Cadmus
Palæmon	Alcidon	Mopſa	Pſyche
Hebe	Iphis	Piramus	Semele
Sappho	Achelous	Philemon	Iphigenia
Acteon	Philomela	Aſtrea	Silvia
Meduſa	Cephalus	Pelias	Alpheus
Orpheus	Mirtilus	Adrianus	Coridon

Ninth		*Tenth*	
Hipolitus	Eſon	Dryope	Iſander
Corilas	Caliſtus	Neſſus	Iſidora
Procris	Arachne	Philoctetes	Melicerte
Capariſſa	Pirus	Marſias	Riblis
Arethuſus	Vertumnus	Licas	Silvander

Order

Order of the Words on the laſt Ten Cards.

Firſt Card	*Second*	*Third*	*Fourth*
Celadon	Andromeda	Silenus	Acis
Pomona	Omphalus	Ariadne	Liſis
Deucalion	Heſiona	Galatea	Thetis
Licas	Calypſo	Medea	Adonis
Latona	Hilas	Thiſbe	Diana
Icarus	Clitander	Alcinous	Endimion
Ganymede	Ariſtea	Hiacinthus	Circe
Leander	Peleus	Caliſta	Cadmus
Hypolitus	Corilas	Procris	Capariſſa
Dryope	Neſſus	Philoctetes	Marſias

Fifth	*Sixth*	*Seventh*	*Eighth*
Eglea	Sirineus	Thyrſis	Polyphemus
Flora	Danae	Alcander	Tireſias
Atys	Palamedes	Melibæus	Orion
Ceres	Caſſandra	Pales	Menelaus
Palæmon	Hebe	Sappho	Acteon
Alcidon	Iphis	Archelous	Philomela
Mopſa	Piramus	Philemon	Aſtrea
Pſyche	Semele	Iphigenia	Silvia
Arethuſus	Eſon	Caliſtus	Arachne
Licas	Iſander	Iſidora	Melicerte

Ninth		*Tenth*	
Proteus	Cephalus	Jaſon	Myrtilus
Iſſoria	Peſias	Narciſſus	Adrianus
Niſus	Alpheus	Daphnis	Corydon
Glaucus	Pirus	Rophelina	Vertumnus
Meduſa	Riblis	Orpheus	Silvander

INSTEAD

INSTEAD of ten cards, there may be twenty to each parcel, by adding duplicates to each card, which will make the recreation appear the more myſterious, and will not at all embarraſs it, as you have nothing to remember but the laſt name on each card. Or, inſtead of names, you may write queſtions on one of the parcels, and anſwers on the other.

Of the Combination of the Cards.

THE tables we here give are the baſis of many recreations, as well on numbers, letters, and other ſubjects, as on the cards; and the effect here produced by them is the more ſurpriſing, as that which ſhould ſeem to prevent any colluſion, that is, the ſhuffling of the cards, is, on the contrary, the cauſe from whence it proceeds.

IT is a matter of indifference what numbers are made uſe of in forming theſe tables. We ſhall here confine ourſelves to ſuch as are applicable to the ſubſequent recreations. Any one may conſtruct them in ſuch manner as is agreeable, to the purpoſe he intends they ſhall anſwer.

TO make them, for example, correſpond to the nine digits and a cypher, there muſt be ten cards, and at the top of nine of them muſt be wrote one of the digits, and on the tenth a cypher. Theſe cards muſt be placed upon each other in the regular order, the number 1 being on the firſt, and the cypher at bottom. You then take the cards in your left hand, as is commonly done in ſhuffling, and taking off the two top cards, 1 and 2, you place the two following, 3 and 4, upon them; and under thoſe four cards the three following, 5, 6, and 7: at the top you put the cards 8 and 9, and at the bottom the card marked 0. Conſtantly placing in ſucceſſion 2 at top and 3 at the bottom, and they will then be in the following order:

8.9..3.4..1.2...5.6.7..0

IF you ſhuffle them a ſecond time, in the ſame manner, they will then ſtand in this order:

6.7..3.4..8.9..1.2.5..0

THUS

THUS, at every new ſhuffle, they will have a different order, as expreſſed in the following lines:

1	ſhuffle	8.9.3.4.1.2.5.6.7.0
2		6.7.3.4.8.9.1 2.5.0
3		2.5.3.4 6.7 8.9.1.0
4		9.1.3.4 2.5.6.7.8.0
5		7.8.3.4.9 1.2.4.6.0
6		5.6.3.4.7.8.9 1.2.0
7		1.2.3.4.5.6 7.8.9.0

IT is a remarkable property of this number, that the cards return to the order in which they were firſt placed, after a number of ſhuffles, which added to the number of columns that never change the order, is equal to the number of cards. Thus the number of ſhuffles is 7, and the number of columns in which the cards marked 3, 4, &c. never change their places is 3, which are equal to 10, the number of the cards. This property is not common to all numbers; the cards ſometimes returning to the firſt order in leſs number, and ſometimes in a greater number of ſhuffles than that of the cards.

THOUGH the cards are here directed to be ſhuffled by twos or threes only, yet tables may be conſtructed with equal facility for ſhuffling them by 2, and 1, 3, and 4, or any other number whatever; obſerving that the fewer cards are taken together, the leſs liable you will be to err.

NOTE, Before you venture to perform theſe recreations, you ſhould accuſtom yourſelf to ſhuffle the cards exactly and readily, which will be eaſily attained by practice.

TABLES

TABLES OF COMBINATIONS,

Constructed on the foregoing Principles.

TABLE I.

FOR TEN NUMBERS.

Order before shuffling.	After 1st shuffle.	After 2d.	After 3d.
1	8	6	2
2	9	7	5
3	3	3	3
4	4	4	4
5	1	8	6
6	2	9	7
7	5	1	8
8	6	2	9
9	7	1	1
0	0	0	0

TABLE

TABLE II.

FOR TWENTY-FOUR NUMBERS.

Order before shuffling.	After 1st shuffle.	After 2d.	After 3d.
1	23	21	17
2	24	22	20
3	18	12	2
4	19	15	7
5	13	5	13
6	14	6	14
7	8	9	3
8	9	8	18
9	3	18	12
10	4	19	15
11	1	23	21
12	2	24	22
13	5	13	5
14	6	14	6
15	7	8	9
16	10	4	19
17	11	1	23
18	12	2	24
19	15	7	8
20	16	10	4
21	17	11	1
22	20	16	10
23	21	17	11
24	22	20	16

TABLE III.

FOR TWENTY-SEVEN NUMBERS.

Order before shuffling.	After 1st shuffle.	After 2d.	After 3d.
1	23	21	17
2	24	22	20
3	18	12	2
4	19	15	7
5	13	5	13
6	14	6	14
7	8	9	3
8	9	3	18
9	3	18	12
10	4	19	16
11	1	23	21
12	2	24	22
13	5	13	5
14	6	14	6
15	7	8	9
16	10	4	19
17	11	1	23
18	12	2	24
19	15	7	8
20	16	10	4
21	17	11	1
22	20	16	10
23	21	17	11
24	22	20	16
25	25	25	25
26	26	26	26
27	27	27	27

TABLE IV.

FOR THIRTY-TWO NUMBERS.

Order before shuffling.	After 1st shuffle.	After 2d.	After 3d.
1	28	26	22
2	29	27	25
3	23	17	7
4	24	20	12
5	18	10	9
6	19	11	3
7	13	1	28
8	14	2	29
9	8	14	2
10	9	8	14
11	3	23	17
12	4	24	20
13	1	28	26
14	2	29	27
15	5	18	10
16	6	19	11
17	7	13	1
18	10	9	8
19	11	3	23
20	12	4	24
21	15	5	18
22	16	6	19
23	17	7	13
24	20	12	4
25	21	15	5
26	22	16	6
27	25	21	15
28	26	22	16
29	27	25	21
30	30	30	30
31	31	31	31
32	32	32	32

Several Letters that contain no meaning, being written upon Cards, to make them after they have been twice ſhuffled, give an Anſwer to a Queſtion that ſhall be propoſed: as for Example, What is Love?

LET 24 letters be written on as many cards, which, after they have been twice ſhuffled, ſhall give the following anſwer:

A Dream of Joy that ſoon is over.

FIRST, write one of the letters in that line on each of the cards*. Then write the anſwer on a paper, and aſſign one of the 24 firſt numbers to each card, in the following order:

A DREAM OF JOY THAT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
SOON IS O'ER.
16 17 18 19 20 21 22 23 24

NEXT, write on another paper a line of numbers, from 1 to 24, and looking in the table for 24 combinations you will ſee that the firſt number after the ſecond ſhuffle is 21, therefore the card that has the firſt letter of the anſwer, which is A, muſt be placed againſt that number in the line of numbers you have juſt made †: in like manner the number 22 being the ſecond of the ſame column, indicates that the card which anſwers to the ſecond letter, D, of the anſwer, muſt be placed againſt that number: and ſo of the reſt. The cards will then ſtand in the following order:

OOFSAMNTOISRHAEO'E
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
JORADYT
18 19 20 21 22 23 24

FROM whence it follows that after theſe cards have been twice ſhuffled they muſt infallibly ſtand in the order of the letters in the anſwer.

OBSERVE 1, You ſhould have ſeveral queſtions with their anſwers, conſiſting of 24 letters, written on cards: theſe cards ſhould be put in caſes, and numbered, that you may know to which

* These letters should be written in capitals on one of the corners of each card, that the words may be easily legible when the cards are spread open:

† For the same reason if you would have the answer after one shuffle, the cards must be placed according to the first column of the table: or if after three shuffles, according to the third column,

which queſtion each anſwer belongs. You then preſent the queſtions; and when any one of them is choſe, you pull out the caſe that contains the anſwer, and ſhewing that the letters wrote on them make no ſenſe, you then ſhuffle them, and the anſwer becomes obvious.

2. To make this recreation the more extraordinary, you may have three cards, on each of which an anſwer is written; one of which cards muſt be a little wider, and another a little longer, than the others. You give theſe three cards to any one, and when he has privately choſe one of them, he gives you the other two, which you put into your pocket, without looking at them, having diſcovered by feeling which he has choſen. You then pull out the caſe that contains the cards that anſwer to his queſtion, and perform as before.

3. You may alſo contrive to have a long card at the bottom, after the ſecond ſhuffle. The cards may be then cut ſeveral times, till you perceive by the touch that the long card is at bottom, and then give the anſwer; for the repeated cuttings, however often, will make no alteration in the order of the cards.

THE ſecond of theſe obſervations is applicable to ſome of the ſubſequent recreations, and the third may be practiſed in almoſt all experiments with the cards. You ſhould take care to put up the cards as ſoon as the anſwer has been ſhewn: ſo that if any one ſhould deſire the recreation to be repeated, you may offer another queſtion, and pull out thoſe cards that contain the anſwer.

THOUGH this recreation cannot fail of exciting at all times pleaſure and ſurpriſe, yet it muſt be owned that a great part of the applauſe it receives ariſes from the addreſs with which it is performed.

The twenty-four Letters of the Alphabet being written upon ſo many Cards, to ſhuffle them, and pronounce the Letters ſhall then be in their natural Order; but that not ſucceeding, to ſhuffle them a ſecond Time, and then ſhew them in proper Order.

WRITE the 24 letters on the cards in the following order:

1 2 3 4 5 6 7 8 9 10 11 12
R S H Q E F T P G U X C
13 14 15 16 17 18 19 20 21 22 23 24
N O D Y Z I K & A B L M

THE cards being diſpoſed in this manner, ſhew them upon the table, that it may appear they are promiſcouſly marked. Then ſhuffle and lay them again on the table, pronouncing that they will be then in alphabetical order. Appear to be ſurpriſed that you have failed; take them up again, and give them a ſecond ſhuffle, and then counting them down on the table they will all be in their natural order.

Several Letters being written promiſcuouſly upon 32 Cards, after they have been once ſhuffled, to find in a Part of them a Queſtion; and then ſhuffling the Remainder a ſecond Time, to ſhew the Anſwer.

SUPPOSE the queſtion to be, *What is each Briton's boaſt?* and the anſwer, *His Liberty;* which taken together contain 32 letters.

AFTER you have written thoſe letters on 32 cards, write on a paper the words *his liberty*, and annex to the letters the firſt ten numbers, thus:

HIS LIBERTY
1 2 3 4 5 6 7 8 9 10

THEN have recourſe to the table of combinations for ten numbers, and apply the reſpective numbers to them in the ſame manner as in the former recreation, taking the firſt column, as theſe are to be ſhuffled only once, according to that order.

IBS LERTHIY
1 2 3 4 5 6 7 8 9 10

THIS is the order in which theſe cards muſt ſtand after the whole number 32 has been once ſhuffled, ſo that after a ſecond ſhuffle they may ſtand in their proper order. Next diſpoſe the whole number of letters according to the firſt column for 32 letters: the laſt ten are to be here placed in the order above; as follows,

WHAT IS EACH BRITON'S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
BOAST?
18 19 20 21 22
IBSLERTHIY
23 24 25 26 27 28 29 30 31 32

THEREFORE

THEREFORE, by the first column of the table, they will next stand thus:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
I T B R O N S C H B O A E A S T long card
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
I I S B S L I B E R T W H H I Y

YOU must observe that the card here placed the 16th in order, being the last of the question, is a long card; that you may cut them, or have them cut, after the first shuffle, at that part, and by that means separate them from the other ten cards that contain the answer.

YOUR cards being thus disposed, you shew that they make no meaning; then shuffle them once, and cutting them at the long card, you give the first part to any one, who reads the question, but can find no answer in the others, which you open before him; you then shuffle them a second time, and shew the answer as above.

To write 32 Letters on so many Cards, then shuffle and deal them by twos to two Persons, in such Manner, that the Cards of one shall contain a Question, and those of the other, an Answer.

SUPPOSE the question to be, *Is nothing certain?* and the answer, *Yes, disappointment.*

OVER the letters of this question and answer write the following numbers, which correspond to the order in which the cards are to be dealt by two and two,

I S N O T H I N G C E R T A I N
31 32 27 28 23 24 19 20 15 16 11 12 7 8 3 4
Y E S D I S A P O I N T M E N T
29 30 25 26 21 22 17 18 13 14 9 10 5 6 1 2

THEN have recourse to the first column of the table for 32 numbers, and dispose these 32 cards in the following order, by that column.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
O I E R G C A N T P I N T A I S
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
T M E H S D I N N O Y N T E I S

THE cards being thus disposed shuffle them once, and deal them two and two; when one of the parties will necessarily have the question, and the other the answer.

INSTEAD

INSTEAD of letters you may write words upon the 32 cards, 16 of which may contain a queſtion, and the remainder the anſwer; or what other matter you pleaſe. If there be found difficulty in accommodating the words to the number of cards, there may be two or more letters or ſyllables written upon one card.

The Five Beatitudes.

THE five bleſſings we will ſuppoſe to be, 1. Science, 2. Courage, 3. Health, 4. Riches, and 5. Virtue. Theſe are to be found upon cards that you deal, one by one, to five perſons. Firſt write the letters of theſe words ſucceſſively, in the order they ſtand, and then add the numbers here annexed to them.

S C I E N C E	C O U R A G E
31 26 21 16 11 6 1	32 27 22 17 12 7 2
H E A L T H	R I C H E S
28 23 18 13 8 3	29 24 19 14 9 4
V I R T U E	
30 25 20 15 10 5	

THEN range them in order, agreeable to the firſt column of the table for 31 numbers, as in the laſt recreation—Thus:

L	H	N	A	T	E	R	E	U	A	C	R	G	T	I	U
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
E	E	C	I	I	C	H	S	O	H	R	E	E	V	S	C
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

NEXT, take a pack of cards, and write on the four firſt the word Science; on the four next the word Courage; and ſo of the reſt.

MATTERS being thus prepared, you ſhew that the cards on which the letters are written convey no meaning. Then take the pack on which the words are written, and ſpreading open the firſt four cards, with their backs upward, you deſire the firſt perſon to chooſe one. Then cloſe thoſe cards, and ſpread the next four to the ſecond perſon; and ſo to all five; telling them to hold up their cards, leſt you ſhould have a confederate in the room.

You then ſhuffle the cards, and deal them one by one, in the common order, beginning with the perſon who choſe the firſt card, and each one will find in his hand the ſame word as is written on his card. You will obſerve, that after the ſixth round

round of dealing, there will be two cards left, which you give to the first and second persons, as their words contain a letter more than the others.

The Cards of the Game of Piquet being mixed together, after shuffling them, to bring, by cutting them, all the Cards of each suit together.

THE order in which the cards must be placed to produce the effect desired, being established on the same principle as that which has been before explained, except, that the shuffling is here to be repeated three times, we think it will be sufficient to give the order in which they are to be placed before the first shuffle.

Order of the Cards.

1 Ace clubs	17 King clubs
2 Knave clubs	18 Ten hearts
3 Eight diamonds	19 Nine hearts
4 Seven diamons wide card	20 Seven clubs
5 Ten clubs	21 Ace diamonds
6 Eight spades	22 Knave spades
7 Seven spades wide card	23 Queen hearts
8 Ten diamonds	24 Knave hearts
9 Nine diamonds	25 Ace spades
10 Queen diamonds	26 King diamonds
11 Knave diamonds	27 Nine clubs
12 Queen clubs	28 Ace hearts
13 Eight hearts	29 King hearts
14 Seven hearts wide card	30 Eight clubs
15 Ten spades	31 King spades
16 Nine spades	32 Queen spades

You then shuffle the cards, and cutting at the wide card, which will be the seven of hearts, you lay the eight cards that are cut, which will be the suit of hearts, down on the table. Then shuffling the remaining cards a second time, you cut at the second wide card, which will be the seven of spades, and lay in like manner, the eight spades down on the table. You shuffle the cards a third time, and offering them to any one to cut,

cut, he will naturally cut them at the wide card*, which is the ſeven of diamonds, and conſequently divide the remaining cards into two equal parts, one of which will be diamonds, and the other clubs.

The Cards at Piquet being all mixed together, to divide the Pack into two equal Parts, and Name the Number of Points contained in each Part.

YOU are firſt to agree, that each king, queen, and knave ſhall count, as uſual, 10, the ace 1, and the other cards according to the number of the points. Then diſpoſe the cards, by the table for 32 numbers, in the following order, and obſerve, that the laſt card of the firſt diviſion muſt be a wide card.

Order of the Cards before ſhuffling.

1 Seven hearts
2 Nine clubs
3 Eight hearts
4 Eight ſpades
5 Knave ſpades
6 Ten ſpades
7 Queen clubs
8 Ace clubs
9 Ace hearts
10 Nine hearts
11 Queen ſpades
12 Knave clubs
13 Ten diamonds
14 Ten hearts
15 King hearts
16 Queen hearts
17 Nine diamonds
18 Ace ſpades
19 Ten clubs
20 Knave diamonds
21 Eight diamonds
22 King diamonds
23 Seven ſpades
24 Seven diamonds
25 Queen diamonds
26 Knave hearts
27 King clubs
28 Nine ſpades
29 King ſpades
30 Ace diamonds
31 Seven clubs
32 Eight clubs.

You

* You muſt take particular notice whether they be cut at the wide card, and if they are not, you muſt have them cut, or cut them again yourſelf.

You then ſhuffle them carefully, according to the method before deſcribed, and they will ſtand in the following order.

Cards.	Numbers.	Cards.	Numbers.
		Brought up	34
1 Nine ſpades	9	6 Ten clubs	10
2 King ſpades	10	7 Ten diamonds	10
3 Seven ſpades	7	8 Ten hearts	10
4 Seven diamonds	7	9 Ace clubs	1
5 Ace ſpades	1	10 Ace hearts (wide card)	1
Carried up	34	Total	66
		Brought up	101
11 Eight hearts	8	22 Queen hearts	10
12 Eight ſpades	8	23 Nine diamonds	9
13 Seven hearts	7	24 Knave diamonds	10
14 Nine clubs	9	25 Eight diamonds	8
15 Knave ſpades	10	26 King diamonds	10
16 Ten ſpades	10	27 Queen diamonds	10
17 Queen clubs	10	28 Knave hearts	10
18 Nine hearts	9	29 King clubs	10
19 Queen ſpades	10	30 Ace diamonds	1
20 Knave clubs	10	31 Seven clubs	7
21 King hearts	10	32 Eight clubs	8
Carried up	101	Total	194

When the cards are by ſhuffling diſpoſed in this order, you cut them at the wide card, and pronounce that the cards you have cut off contain 66 points, and conſequently the remaining part 194. This recreation excites a great degree of admiration, but the applying theſe cards to the next recreation produces a much greater.

The inconceivable Repique.

When you would perform this recreation with the cards uſed in the laſt, you muſt obſerve not to diſorder the firſt ten cards in laying them down on the table. Putting thoſe cards together, in their proper order, therefore you ſhuffle them a ſecond time in the ſame manner, and offer them to any one to cut, obſerving carefully if he cut them at the wide card, which will be the ace of hearts, and will then be at top; if not you muſt

muſt make him, under ſome pretence or other, cut them till it is; and the cards will then be ranged in ſuch order that you will repique the perſon againſt whom you play, though you let him chooſe (even after he has cut) in what ſuit you ſhall make the repique.

Order of the Cards after they have been ſhuffled and cut.

1 Eight hearts
2 Eight ſpades
3 Knave ſpades
4 Ten ſpades
5 Queen clubs
6 Knave clubs
7 King hearts
8 Queen hearts
9 Eight diamonds
10 King diamonds
11 Queen diamonds
12 Ace diamonds
13 Seven clubs
14 Eight clubs
15 Knave hearts
16 King clubs
17 Nine diamonds
18 Knave diamonds
19 Nine hearts
20 Queen ſpades
21 Seven hearts
22 Nine clubs
23 Ten hearts
24 Ace clubs
25 Seven ſpades
26 Seven diamonds
27 Nine ſpades
28 King ſpades
29 Ace ſpades
30 Ten clubs
31 Ten diamonds
32 Ace hearts
wide card

The cards being thus diſpoſed, you aſk your adverſary in what ſuit you ſhall repique him. If he ſay in clubs, or diamonds, you muſt deal the cards by threes, and the hands will be as follows:

Elder.	Younger.
Hearts, king	Clubs, ace
——queen	——king
——knave	——queen
——nine	——knave
——eight	——nine
——ſeven	Diamonds, ace
Spades, queen	——king
——knave	——queen
——eight	——knave
Diamonds, eight	——nine
Clubs, eight	Spades, ten
——ſeven	Hearts, ten

Rentree

Rentree, or take in of the elder.	Rentree of the younger
Seven ſpades	Ten clubs
Seven diamonds	Ten diamonds
Nine ſpades	Ace hearts
King ſpades	
Ace ſpades	

If he againſt whom you play, who is ſuppoſed to be elder hand, has named clubs, for the repique, and has taken in five cards, you muſt then lay out the queen, knave, and nine of diamonds, and you will have, with the three cards you take in, a ſixiem major in clubs, and quatorze tens. If he leave one or two cards, you muſt diſcard all the diamonds.

If he require to be repiqued in diamonds, then diſcard the queen, knave, and nine of clubs: or all the clubs, if he leave two cards; and you will then have a hand of the ſame ſtrength as before.

Note, If the adverſary ſhould diſcard five of his hearts, you will not repique him, as he will then have a ſeptiem in ſpades: or if he only take one card: but neither of theſe any one can do, who has the leaſt knowledge of the game. If the perſon againſt whom you play would be repiqued in hearts or ſpades, you muſt deal the cards by twos, and the game will ſtand thus:

Elder hand.	Younger hand.
King diamonds	Ace clubs
Knave diamonds	King clubs
Nine diamonds	Ace diamonds
Eight diamonds	Queen diamonds
Queen clubs	Queen ſpades
Knave clubs	Knave ſpades
Nine clubs	Ten ſpades
Eight clubs	King hearts
Seven clubs	Queen hearts
Eight hearts	Knave hearts
Seven hearts	Ten hearts
Eight ſpades	Nine hearts
Rentree.	Rentree.
Seven ſpades	Ten clubs
Seven diamonds	Ten diamonds
Nine ſpades	Ace hearts
King ſpades	
Ace ſpades	

If he require to be repiqued in hearts, you keep the quint to a king in hearts, and the ten of ſpades, and lay out which of the reſt you pleaſe: then, even if he ſhould leave two cards, you will have a ſixiem major in hearts, and quartorze tens, which will make a repique.

But if he demand to be repiqued in ſpades; at the end of the deal you muſt dextrouſly paſs the three cards that are at the bottom of the ſtock (that is, the ten of clubs, ten of diamonds, and ace of hearts) to the top, and by that means you reſerve the nine, king, and ace of ſpades for yourſelf: ſo that by keeping the quint in hearts, though you ſhould be obliged to lay out four cards, you will have a ſixiem to a king in ſpades, with which, and the quint of hearts, you muſt make a repique.

Observe here likewiſe, that if the adverſary lay out only three cards, you will not make the repique; but that he will never do, unleſs he be quite ignorant of the game, or has ſome knowledge of your intention.

This laſt ſtroke of piquet has gained great applauſe, when thoſe that have publickly performed it, have known how to conduct it dextrouſly. Many perſons who underſtand the nature of combining the cards, have gone as far as the paſſing the three cards from the bottom of the ſtock, and have then been forced to confeſs their ignorance of the manner in which it was performed.

The metamorphoſed Cards.

PROVIDE thirty-two cards that are differently coloured; on which ſeveral different words are wrote, and different objects painted. Theſe cards are to be dealt two and two, to four perſons, and at three different times, ſhuffling them each time. After the firſt deal every one's cards are to be of the ſame colour: after the ſecond deal, they are all to have objects that are ſimilar; and after the third, words that convey a ſentiment.

Diſpoſe

Diſpoſe of the cards in the following order.

Order of the cards.	Colours.	Objects.	Words.
1	Yellow	Bird	I find
2	Yellow	Bird	In you
3	Green	Flower	Charming
4	Green	Flower	Flowers
5	White	Bird	To hear
6	White	Orange	Beauty
7	Red	Butterfly	My
8	Red	Flower	Notes
9	Red	Flower	In
10	Red	Butterfly	Shepherdeſs
11	Green	Butterfly	Lover
12	Green	Butterfly	Your
13	White	Flower	Of
14	White	Flower	an inconſtant
15	Yellow	Orange	Image
16	Yellow	Flower	Inchanting
17	White	Orange	Ardor
18	Yellow	Butterfly	My
19	Yellow	Butterfly	Phyllis
20	White	Bird	Birds
21	Red	Orange	Sing
22	Red	Orange	Dear
23	Green	Orange	and Sweetneſs
24	Green	Orange	The
25	Green	Bird	Of
26	Green	Bird	Preſent
27	Yellow	Flower	As
28	Red	Bird	Changes
29	Red	Bird	Boſom
30	Yellow	Orange	Me
31	White	Butterfly	Your
32	White	Butterfly	I long

The cards thus coloured, figured and tranſcribed, are to be put in a caſe, in the order they here ſtand.

When you would perform this recreation you take the cards out of the caſe, and ſhew, without changing the order in which they were put, that the colours, objects, and words are all placed promiſcuouſly. You then ſhuffle them in the

ſame manner as before, and deal them two and two, to four perſons, obſerving that they do not take up their cards till all are dealt, nor mix them together: and the eight cards dealt to each perſon will be found all of one colour. You then take each perſon's cards, and put thoſe of the ſecond perſon under thoſe of the firſt, and thoſe of the fourth perſon under thoſe of the third. After which you ſhuffle them a ſecond time, and having dealt them in the ſame manner, on the firſt perſon's cards will be painted all the birds; on the ſecond perſon's cards, all the butterflies; on thoſe of the third, the oranges; and on thoſe of the fourth, the flowers. You take the cards a ſecond time, and obſerving the ſame precautions, ſhuffle and deal them as before, and then the firſt perſon, who had the laſt time the birds in his hands, will have the words in his hand that compoſe this ſentence,

Sing, dear birds, I long to hear your enchanting notes.

The ſecond perſon, who had the laſt deal, the butterflies, will now have theſe words,

Of an inconſtant lover your changes preſent me the image.

The third, who had the oranges, will have this ſentence,

As in my Phyllis, I find in you, beauty and ſweetneſs.

The fourth, who had the flowers, will have theſe words,

Charming flowers, adorn the boſom of my ſhepherdeſs.

It ſeems quite unneceſſary to give any farther detail, as they who underſtand the foregoing recreations will eaſily perform this.

The Repique with Carte Blanch.

IN the following recreations relative to piquet, we ſhall confine ourſelves to the order in which the cards muſt ſtand after they are cut, and ready to be dealt. They who chooſe to ſhuffle them firſt (in order to make the performance appear the more extraordinary) may eaſily diſpoſe them in a proper order for that purpoſe, by having recourſe to the table of combinations for 32 numbers

Order

Order of the Cards.

Elder	1	Ace ſpades
	2	Seven ſpades
Younger	3	Seven clubs
	4	Ten hearts
E.	5	Ace hearts
	6	Knave ſpades
Y.	7	Nine hearts
	8	Eight clubs
E.	9	Queen ſpades
	10	Ace diamonds
Y.	11	Eight hearts
	12	Eight ſpades
E.	13	Queen diamonds
	14	Ace clubs
Y.	15	Nine diamonds
	16	Nine clubs
E.	17	King diamonds
	18	Ten diamonds
Y.	19	Seven hearts
	20	Seven diamonds
E.	21	Nine ſpades
	22	Knave diamonds
Y.	23	Ten clubs
	24	Eight diamonds
	25	King hearts }
	26	King clubs }
	27	Queen hearts } Elder's rentree
	28	King ſpades }
	29	Ten ſpades }
	30	Queen clubs }
	31	Knave clubs } Younger's rentree
	32	Knave hearts }

THE cards being thus diſpoſed, the hands of the players, after they have been dealt two and two, will be as follows: —

Elder.	Younger.
Ace ſpades	Ten clubs
Queen ſpades.	Nine clubs
Knave ſpades	Eight clubs
Nine ſpades	Seven clubs
Seven ſpades	Ten hearts
Ace diamonds	Nine hearts
King diamonds	Eight hearts
Queen diamonds	Seven hearts
Knave diamonds	Nine diamonds
Ten diamonds	Eight diamonds
Ace hearts	Seven diamonds
Ace clubs	Eight ſpades

The Rentree.

King hearts	Queen clubs
Queen hearts	Knave clubs
King clubs	Knave hearts.
King ſpades	
Ten ſpades	

THE cards being thus dealt, you deſire the other player to caſt his eye over the two hands, and take which he pleaſe, on condition, that if he keep the hand dealt him he ſhall be eldeſt; but if he take the other he ſhall be youngeſt.

IF he keep the hand dealt him, which in appearance is much preferable to the other, he will naturally lay out the four loweſt ſpades, and leave a card, by carrying the quint in diamonds and four aces. You then tell down your carte blanch, and keeping the two quarts in clubs and hearts, lay out the others, and with your rentree you will have a ſixiem in clubs and a quint in hearts, with which you will make a repique, counting 107 points, though if the cards were played you would be capoted.

IF the oppoſite player chooſe the youngeſt hand, you then diſcard the quart to a king in diamonds with the ſeven of ſpades, and with your rentree you will have a ſixiem major in ſpades, and quatorze of aces; by which you will make repique and capot.

HERE

HERE alſo you may miſs the repique, if the other player keep the hand dealt him, and diſcard his diamonds; but this, as in the other caſes, no one will do, who has any knowledge of the game.

Caſe at Piquet, where you repique the elder Hand, though he have the Choice of the Cards after they are dealt.

THE cards muſt here ſtand, after they have been cut, in the following order.

Elder	1	Ace ſpades
	2	Eight ſpades
Younger	3	Knave clubs
	4	Ten clubs
E.	5	Ace clubs
	6	Nine hearts
Y.	7	Eight clubs
	8	Nine diamonds
E.	9	Queen clubs
	10	Eight diamonds
Y.	11	Seven clubs
	12	Ten diamonds
E.	13	Ten ſpades
	14	Eight hearts
Y.	15	Nine clubs
	16	King clubs
E.	17	King ſpades
	18	Queen ſpades
Y.	19	Knave diamonds
	20	Seven ſpades
E.	21	Seven diamonds
	22	Knave ſpades
Y.	23	Seven diamonds
	24	Knave ſpades
	25	King hearts
	26	Knave hearts
Rentree E.	27	Queen hearts
	28	Seven hearts
	29	Ten hearts
	30	Ace hearts
Rentree Y.	31	Queen diamonds
	32	King diamonds

The cards being thus diſpoſed * when they are dealt, the hands of the two players will be as follows.

Elder.	Younger.
Spades, ace	Diamonds, ace
——— king	——— knave
——— queen	——— ten
——— knave	——— nine
——— ten	Clubs, king
——— eight	——— knave
Clubs, ace	——— ten
——— queen	——— nine
Hearts, nine	——— eight
——— eight	——— ſeven
Diamonds, eight	Spades, nine
——— ſeven	——— ſeven

Rentree.	Rentree.
King hearts	Seven hearts
Queen hearts	Ace hearts
Knave hearts	King diamonds
Ten hearts	Queen diamonds

You then give the other players the liberty of chooſing either hand, but without ſeeing them. If he chooſe the elder hand, you diſcard the king of clubs, with the nine and ſeven of ſpades, and by your rentree you will have a ſixiem in diamonds and the point which will make 22, and then added to the quint in clubs will make 97, and you will neceſſarily win, as the adverſary will not fail to lay out his two ſmall hearts.

If, on the contrary, he chooſe the younger hand, you diſcard the knave, ten and eight of ſpades, with the ſeven and eight of diamonds: then by taking in the quint to a king in hearts, you will have a ſeptiem in hearts, a tierce major in ſpades, and three queens, which will tell 90, though the adverſary ſhould diſcard to the moſt advantage poſſible.

* In all these Recreations with piquet, there should be a wide card last, that they may be properly cut.

Caſe

Caſe at Piquet, where you give the other Player not only the Choice of the ſuit in which he will be repiqued, but that of dealing the Cards by Twos or by Threes, and of taking either Hand after they are dealt, you being to tell and play firſt.

THE cards muſt be diſpoſed as follows:

1 Queen clubs	17 Queen ſpades
2 Nine clubs	18 Nine ſpades
3 Eight clubs	19 Eight ſpades
4 Seven clubs wide card	20 Seven ſpades wide card
5 Ace hearts	21 Ace diamonds
6 King hearts	22 King diamonds
7 Knave hearts	23 Knave diamonds
8 Ten hearts	24 Ten diamonds
9 Queen hearts	25 Queen diamonds
10 Nine hearts	26 Nine diamonds
11 Eight hearts	27 Eight diamonds
12 Seven hearts wide card	28 Seven diamonds wide card
13 Ace ſpades	29 Ace clubs
14 King ſpades	30 King clubs
15 Knave ſpades	31 Knave clubs
16 Ten ſpades	32 Ten clubs

It is evident by this diſpoſition of the cards, that if they are cut at any one of the wide cards, which are the laſt of each ſuit, there will be always a ſtock of eight cards of the ſame ſuit. Conſequently, if he with whom you play require to be repiqued in clubs, by cutting at the firſt wide card, which is the ſeven of clubs, the eight clubs will neceſſarily be at the bottom of the pack, and you will have for your rentree a quint major in clubs. The ſame will happen in all the other ſuits, by cutting at the ſeven of each. If he deal the cards by twos, the hands will be as follows *.

* The hands will be always the same, though in different suits.

Elder

Elder.	Younger.
Ace hearts	Knave hearts
King hearts	Ten hearts
Queen hearts	Eight hearts
Nine hearts	Seven hearts
Ace ſpades	Knave ſpades
King ſpades	Ten ſpades
Queen ſpades	Eight ſpades
Nine ſpades	Seven ſpades
Ace diamonds	Knave diamonds
King diamonds	Ten diamonds
Queen diamonds	Eight diamonds
Nine diamonds	Seven diamonds
	Rentree.
Ace clubs	Nine clubs
King clubs	Eight clubs
Knave clubs	Seven clubs
Ten clubs	
Queen clubs	

But if he deal the cards by threes, the hands will ſtand thus:

Elder.	Younger.
Ace hearts	Ten hearts
King hearts	Queen hearts
Knave hearts	Nine hearts
Seven hearts	King ſpades
Ace ſpades	Knave ſpades
Queen ſpades	Ten ſpades
Nine ſpades	Seven ſpades
Eight ſpades	Ace diamonds
Knave diamonds	King diamonds
Ten diamonds	Nine diamonds
Queen diamonds	Eight diamonds
	Seven diamonds
	Rentree.
Ace clubs	Nine clubs
King clubs	Eight clubs
Knave clubs	Seven clubs
Ten clubs	
Queen clubs	

If the other player require to be repiqued in ſpades, you cut them at the 7 of that ſuit, and tell him he is at liberty to deal them by twos or threes*. If he deal them by twos, he is to chooſe which hand he will have, without ſeeing them; you being ſtill eldeſt.

If he keep his own hand, you diſcard the nine of hearts, ſpades, and diamonds, and either of the two queens; and by your rentrée you will have a quint major in clubs, quatorze aces, and quatorze kings, by which you make a repique. But if he chooſe the cards dealt for the elder, you diſcard the ſeven of hearts, ſpades, and diamonds, and any two of the eights; and you will have by your rentree the ſame quint in clubs, quatorze queens and quatorze knaves: which will alſo make a repique.

If the adverſary deal the cards by threes, and keep his hand, you diſcard the king, eight and ſeven of hearts, with the nine and eight of ſpades; and by your rentree you will have the quint major in clubs, a tierce to a queen in diamonds, three aces, three queens, and three knaves, with which you make a repique. But if he chooſe the cards dealt for the elder, you diſcard the queen and nine of hearts, the knave and ſeven of ſpades, and the ace of diamonds, and you will then have the ſame quint in clubs, a tierce to a nine in diamonds, three kings and three tens, with which you will tell 29 points, therefore by playing one, you can in this caſe make a pique only.

An exemplary Caſe at Piquet, where you repique your Adverſary, after giving him the Choice of having the Cards dealt either by Twos or Threes.

TO diſpoſe the cards in the order neceſſary to produce the effect here required, and in all others where you give the choice of having the cards dealt either by twos or threes, you muſt have recourſe to the following table.

* You are to take care he does not ſhuffle the cards; and the better to prevent it, you may ſo diſpoſe them as to ſhuffle them before him, after the manner explained in ſome of the foregoing Recreations.

Cards

Cards that will go to the eldeſt.	Numb. of the Cards.	Cards that will come to the youngeſt.	Variable cards.
1 ☞	1		
2 ☞	2		
	3	- - -	3 ☞
	4	4 ☞	
	5	- - -	5 ☞
	6	- - -	6 ☞
	7	- - -	7 ☞
	8	- - -	8 ☞
9 ☞	9		
	10	- - -	10 ☞
	11	11 ☞	
	12	12 ☞	
13 ☞	13		
14 ☞	14		
	15	- - -	15 ☞
	16	16 ☞	
	17	- - -	17 ☞
	18	- - -	18 ☞
	19	- - -	19 ☞
	20	- - -	20 ☞
21 ☞	21		
	22	- - -	22 ☞
	23	23 ☞	
	24	24 ☞	

THIS table ſhews the different hands that reſult from the two different methods of dealing the cards; that the eldeſt hand has always, in ſome order or other, the ſix cards placed againſt the numbers, 1, 2, 9, 13, 14, and 21; and the younger, the ſix cards placed againſt 4, 11, 12, 16, 23, and 24. It ſhews likewiſe, that the 12 cards marked 3, 5, 6, 7, 8, 10, 15, 17, 18, 19, 20, and 22, may be in either hand, ſo far as concerns the manner of dealing the cards.

BEING

BEING therefore certain when you deal, that the cards marked 1, 2, 9, 13, 14, and 21, will always be in the adverſary's hand, and theſe marked 4, 11, 12, 16, 23, and 24, will be in your own hand, you muſt apply your ſix numbers to ſuch cards, as with the three of the rentree, (which you may chooſe as you pleaſe) will always make a great hand, and ſuperior to the adverſary. The great cards which you are forced to leave, you muſt diſtribute among the variable cards, in ſuch manner that they can have no remarkable effect, when dealt either way.

THIS method we have obſerved in the following example, which we here give for the ſatisfaction of thoſe who would compoſe theſe ſorts of games themſelves. To the numbers 4, 11, 12, 16, 23, and 24, annex a ſixiem major in hearts, which joined to the three tens of the rentree are ſufficient to make a repique, youngeſt hand. But as you muſt prevent the elder hand from defeating your point, by having ſeven cards in any of the other ſuits, you are ſo to diſpoſe ſome part of each ſuit, by the column of variable cards, that he may never have, whether the cards are dealt by twos or threes, any large ſequence * : as you will ſee by the following diſpoſition of the cards.

1 King diamonds
2 Ace diamonds
3 Nine diamonds
4 Ace hearts
5 Queen ſpades
6 Eight diamonds
7 Queen clubs
8 Eight ſpades
9 King clubs
10 Seven hearts
11 King hearts
12 Nine hearts
13 Queen diamonds
14 Seven diamonds
15 Seven clubs
16 Knave hearts
17 Ace clubs
18 Seven ſpades
19 King ſpades
20 Ace ſpades
21 Knave diamonds
22 Eight clubs
23 Ten hearts
24 Queen hearts
25 Knave ſpades
26 Nine ſpades
27 Knave clubs
28 Eight hearts
29 Nine clubs
30 Ten diamonds
31 Ten ſpades
32 Ten clubs

* If you cannot effect this by the cards that are to be dealt the adversary, you must so dispose his rentree, that he may lay out his game, as in the metamorphosed cards.

By this arrangement of the cards you will be ſure to ſucceed, whether you deal the cards by twos or threes: even though the adverſary, thinking to fruſtrate your intention, ſhould leave three cards.

REMARK. There is no danger that any of theſe recreations at piquet ſhould be applied to a bad purpoſe, for after the cards have been once ſhuffled by both players, it will be impoſſible to ſucceed in any one of them. There are, however, tricks to be played at this, as at all other games, with the cards; ſuch as changing the whole pack, or ſome particular cards, or taking in part, or all the diſcard, or making the paſs, that is, bringing part of the cards at bottom to the top, as will be more fully explained, all of which many perſons can perform ſo dextrouſly, that it is impoſſible for the eye to diſcover them. We ſay nothing of the practice of marking the cards, for of that almoſt every one's experience will afford ſufficient proof. To aggravate the misfortune, it is indubitably true, that many perſons who are ſtrictly honeſt in all other reſpects, are diſhoneſt at cards; and that no rank or condition of men, no, nor women neither, is entirely free from this vice.

Several different Cards being ſhewn to different Perſons, that each of them may fix on one of thoſe Cards, to name that on which each Perſon fixed.

THERE muſt be as many different cards ſhewn to each perſon, as there are perſons to chooſe; therefore, ſuppoſe there are three perſons, then to each of them you muſt ſhew three cards, and telling the firſt perſon to retain one in his memory, you lay thoſe three cards down, and ſhew three others to the ſecond perſon, and ſo to the third. You then take up the firſt perſon's cards, and lay them down, one by one, ſeparately, with their faces upwards. You next place the ſecond perſon's card over the firſt, and in like manner the third perſon's card over the ſecond's; ſo that in each parcel there will be one card belonging to each perſon. You then aſk each of them in which parcel his card is, and when you know that, you immediately know which card it is; for the firſt perſon's card will always be the firſt, the ſecond perſon's the ſecond, and the third perſon's the third, in that parcel where they each ſay his card is.

THIS Recreation may be performed with a ſingle perſon, by letting him fix on three, four, or more cards. In this caſe you

you muſt ſhew him as many parcels as he is to chooſe cards, and every parcel muſt conſiſt of that number, out of which he muſt fix on one; and you then proceed as before, he telling you the parcel that contains each of his cards.

To name the Rank of the Card that a Perſon has drawn from a piquet Pack.

BY the rank of the card we mean whether it be ace, king, queen, &c. You are therefore firſt to fix a certain number to each card, thus, you call the king 4, the queen 3, the knave 2, the ace 1, and the others according to the number of their pips.

You then ſhuffle the cards, and let the perſon draw any one of them: then turning up the remaining cards, you add the number of the firſt to that of the ſecond, that to the third, and ſo on, till it amount to ten, which you then reject and begin again; or if it be more, you reject the ten, and carry the remainder to the next card; and ſo continue till you come to the laſt card: and to the laſt amount you muſt add 4, and ſubtract that ſum from 10 if it be leſs, or from 20 if it be more than 10, and the remainder will be the number of the card that was drawn: as for example, if the remainder be 2, the card drawn was a knave; if 3, a queen, &c.

To tell the Amount of the Numbers of two Cards that a Perſon has drawn from a common Pack of Cards.

THE ſmall cards here tell, as before, according to the number of their pips, but each pictured card tells for 10. Let the perſon add as many more cards to each of thoſe he has drawn, as will make each of their numbers 25. Then take the remaining cards in your hand, and ſeeming to ſearch for ſome card among them, tell them over to yourſelf, and their number will be the amount of the two cards drawn. An example will make this plain. Suppoſe the perſon has drawn a 10 and a 7, then he muſt add 15 cards to the firſt, to make the number 25, and 18 cards to the laſt, for the ſame reaſon: now 15 and 18 make 33, and the two cards themſelves make 35, which deducted from 52 leaves 17, which muſt be the number of the remaining cards, and alſo of the two cards drawn.

THIS Recreation may be performed without your touching the cards, thus: let the perſon who has drawn the two cards

deduct the numbers of each of them from 26, which is half the number of the pack, and after adding the remainders together, let him tell you the amount, which you privately deduct from 52, the number of all the cards, and the remainder will be the amount of the two cards. For example, ſuppoſe the two cards to be, as before, 10 and 7; then the perſon deducting 10 from 26 there remain 16; and deducting 7 from 26 there remain 19; thoſe two remainders added together will make 35, which you ſubtract from 52, and there muſt remain 17, for the amount of the two cards, as before.

As the number 26 may be thought to lead to a diſcovery of the principle on which the Recreation is founded, it being manifeſtly the half of the pack, to render it more myſterious you may take any other number leſs than 26, but greater than 10, as for example 24, and let the party ſubtract the number of each of his cards from that; therefore, ſuppoſing the numbers to be as before 10 and 7, the remainders will be 14 and 17, which make 31, to which you muſt add 4, for the double of the 2 you took from 26, and the amount will be 35, which is to be deducted from 52, as before. By this alteration the performance will not only be rendered more abſtruſe, but alſo more diverſified, as you may change the number, from which thoſe of the two cards are to be deducted, every time you repeat the experiment.

THIS Recreation may be performed, equally well, with a pack of piquet cards, and then the numbers of the two cards muſt be deducted from 16, which is the half of the pack; or if you chooſe to make it more myſterious, from any other number leſs than 16 and more than 10; afterwards adding, as in the laſt caſe, the double of what that number wants to make it 16.

To tell the Amount of the Numbers of any three Cards that a Perſon ſhall draw from the Pack.

AFTER the party has drawn his three cards, you are to draw one yourſelf, and lay it aſide; for it is neceſſary that the number of the remaining cards be diviſible by 3, which they will not be, in a pack of 52 cards, if only 3 be drawn. The card you draw you may call the confederate, and pretend it is by the aid of that card you diſcover the amount of the others. Then tell the party to add as many more to each of his cards, as will make its number 16, which is the third part of the remaining

remaining 48 cards; therefore, ſuppoſe he has drawn a 10, a 7, and a 6: to the firſt he muſt add 6 cards, to the ſecond 9, and to the third 10, which together make 25, and the 4 cards drawn being added to them make 29. You then take the remaining cards, and telling them over, as in the laſt Recreation, you find their number to be 23, which muſt be the amount of the three cards the perſon drew.

You may perform this Recreation likewiſe without touching the cards, as thus: after the party has drawn his three cards, and you have drawn one, let him deduct the number of each of the cards he has drawn from 17, which is one third of the pack, after you have drawn your card; and let him tell you the amount of the ſeveral remainders, to which you privately add one for the card you drew, and deducting that amount from 52, the whole number of cards, the remainder will be the amount of the three cards drawn. For example, ſuppoſe the three cards to be 10, 7, and 6, as before; then each of thoſe numbers being ſubtracted from 17, the remainders will be reſpectively 7, 10, and 11, which, added together, make 28, to which the ſingle card you drew being added makes 29, and that number deducted from 52 leaves 23, which is the amount of the three cards the party drew.

THERE is little reaſon to imagine any one will diſcover why you here make choice of the number 17; but if you are deſirous of rendering the Recreation ſtill more abſtruſe, and at the ſame time ſuſceptible of greater variety, you may fix on any other number leſs than 17, but more than 10; and afterwards add to the amount of the remainders the double of what that number is leſs than 17; in the ſame manner as in the laſt Recreation.

THIS Recreation alſo may be performed with a pack of piquet cards; but then you muſt draw, or, what will anſwer the ſame purpoſe, deduct 2, in your own mind, from the whole number 32, that the remainder may be diviſible by 3; and let him deduct the number of each of his cards from that ſum, which is 10, and add the remainders together, as before; thus, if his three cards be 10, 7, and 6, he is to deduct each of them from 10, which is the third part of 30; therefore the remainders will be 0, 3, and 4, which, added together, make 7, and that added to the 2 you deducted from the whole number, makes 9, which taken from 32, leaves 23, and that muſt be the amount of his three cards.

AMONG the different purpoſes to which the doctrine of combinations may be applied, thoſe of writing in cypher, and decyphering, hold a principal place, as will appear by the following Recreations.

To communicate Intelligence by a Pack of Piquet Cards.

The parties muſt previouſly agree in what manner the cards ſhall be firſt placed, and then how they ſhall be ſhuffled. Thus, ſuppoſe the cards are to be firſt placed in the order as hereafter follows, and then ſhuffled by taking off 3 from the top, putting the next 2 over them, and the following 3 under them*, and ſo alternately. Therefore the party who ſends the cypher firſt writes the contents of it on a ſeparate paper, and then copies the firſt 32 letters on the cards, by writing one letter on every card; he then ſhuffles them in the manner deſcribed, and writes the ſecond 32 letters: he ſhuffles them a ſecond time and writes the third 32 letters, and ſo of the reſt. An example will make this plain. Suppoſe the letter to be as follows:

I am in full march to relieve you; within three days I ſhall be with you. If the enemy in the mean time ſhould make an aſſault, remember what you owe to your country, to your family and yourſelf. Live with honour or die with glory.

Order of the cards before the 1ſt ſhuffle.

Ace ſpades	*i a d u y i*
Ten diamonds	*a l e u l*
Eight hearts	*m l m o i u*
King ſpades	*i s u m l*
Nine clubs	*n h l e o*
Seven diamonds	*f b m r i*
Nine diamonds	*u e a c t n*
Ace clubs	*l w k r y i*
Knave hearts	*l s e e a e*
Seven ſpades	*m i a r m w*
Ten clubs	*a i t h e r*
Ten hearts	*r r h o f*
Queen ſpades	*c h e e i*
Eight diamonds	*h a b y w*
Eight clubs	*t y o o o l*

Seven

* By ſhuffling the cards in this manner, there will remain only two to put under at laſt.

Seven hearts	*o y a o h o*
Queen clubs	*r o n u y h*
Nine ſpades	*e u i y ſ y*
King hearts	*l e t e u o*
Queen diamonds	*e d s o e*
Eight ſpades	*i i n w s o*
Knave clubs	*v f a n t g*
Seven clubs	*e t s l y*
Ace hearts	*y r e b r*
Nine hearts	*o l n w o t*
Ace diamonds	*u h s t & d*
Knave ſpades	*w l m a l*
Ten ſpades	*i e y t r r*
King diamonds	*t t i b u r*
Queen hearts	*h h m m w*
King clubs	*i n a t h*
Knave diamonds	*n e u r o*

THE perſon that receives theſe cards firſt places them in the order agreed on, and tranſcribes the firſt letter on every card. He then ſhuffles them, according to order, and tranſcribes the ſecond letter on each card. He ſhuffles them a ſecond time and tranſcribes the third letter; and ſo of the reſt.

IF the cards were to be ſhuffled the ſecond time by threes and fours, the third time by twos and fours, &c. it would make the cypher ſtill more difficult to diſcover: though as all cyphers depend on the combination of letters, there are ſcarce any that may not be decyphered with time and pains; as we ſhall ſhew farther on. Thoſe cyphers are the beſt, that are by their nature moſt free from ſuſpicion of being cyphers; as for example, if the letters were here wrote with one of the ſympathetic inks, the cards might then paſs for a common pack.

The Card diſcovered under the Handkerchief.

LET a perſon draw any card from the reſt, and put it in the middle of the pack. You make the paſs at that place, and the card will conſequently be at top. Then placing the pack on the table, cover it with a handkerchief, and putting your hand under it, take off the top card, and after ſeeming to ſearch among the cards for ſome time, draw it out.

THIS Recreation may be performed by putting the cards in another perſon's pocket, after the paſs is made. Several cards may

may alſo be drawn and placed together in the middle of the pack, and the paſs then made.

To change the Cards that ſeveral Perſons have drawn from the Pack.

ON the top of the pack put any card you pleaſe, ſuppoſe the queen of clubs. Make the paſs, and bring that card to the middle of the pack, and offer it a perſon to draw. Then, by cutting the cards, bring the queen again to the middle of the pack. Make the paſs a ſecond time, and bring it to the top, and ſhuffle the cards without diſplacing thoſe on the top. Make the paſs a third time, and bring it to the middle of the pack, and offer it to a ſecond perſon to draw; who muſt be at a proper diſtance from the firſt perſon, that he may not perceive it is the ſame card. After the like manner did five perſons draw the ſame card.

SHUFFLE the pack, without loſing ſight of the queen of clubs, and laying down four other cards with the queen, aſk each perſon if he ſees his card there. They will all reply *yes*, as they all drew the queen of clubs. Place four of thoſe cards to the pack, and drawing the queen privately away; you approach the firſt perſon, and ſhewing him that card, ſo that the others cannot ſee it, and aſk if that be his card. Then putting it on the top of the pack blow on it, or give it a ſtroke with your hand, and ſhew it in the ſame manner to the ſecond perſon; and ſo of the reſt.

The Four inſeparable Kings.

TAKE the four kings, and behind the laſt of them place two other cards, ſo that they may not be ſeen. Then ſpread open the four kings to the company, and put the ſix cards at the bottom of the pack. Draw one of the kings, and put him at the top of the pack. Draw one of the two cards at the bottom and put it towards the middle. Draw the other, and put it at ſome diſtance from the laſt, and then ſhew that there remains a king at bottom. Then let any one cut the cards, and as there remained three kings at bottom, they will then be altogether in the middle of the pack.

To tell the Number of Cards by their Weight.

TAKE a parcel of cards, ſuppoſe 40, among which inſert two long cards; let the firſt be, for example, the 15th, and the other the 26th from the top. Seem to ſhuffle the cards, and then

then cutting them at the firſt long card, poiſe thoſe you have cut off in your left hand, and ſay, "there ſhould be here fifteen cards." Cut them again at the ſecond long card, and ſay, "there are here only eleven cards." Then poiſing the remainder, you ſay, "here are fourteen cards."

To diſcover the Card that is drawn by the throw of a Die.

PREPARE a pack of cards, in which ſix different cards are contained ſix times; that is in which there are only ſix ſorts of cards. Diſpoſe theſe cards in ſuch manner that each of the ſix different cards ſhall follow each other, and let the laſt of each ſuit be a long card. The cards being thus diſpoſed, it follows, that if you divide them into ſix parcels, by cutting at each of the long cards, thoſe parcels will all conſiſt of ſimilar cards.

LET a perſon draw a card from the pack, and let him replace it in the parcel from whence it was drawn, by dextrouſly offering that part. Cut the cards ſeveral times, ſo that a long card may be always at bottom. Divide the cards in this manner into ſix heaps, and giving a die to the perſon who drew the card, tell him that the point he throws ſhall indicate the parcel in which is the card he drew; then take up that parcel and ſhew him the card.

YOU ſhould put the cards in your pocket immediately after performing this recreation, and have another pack, ready to ſhew, if any one ſhould aſk to ſee the cards.

To ſeparate the two Colours of a Pack of Cards by one cut.

THE pack muſt be prepared thus: All the cards of one colour muſt be cut ſomething narrower at the end than the other. You ſhew the cards, and give them to any one that he may ſhuffle them, then holding them between your hands, one hand being at each extremity, with one motion you ſeparate the hearts and diamonds from the ſpades and clubs.

THIS Recreation is eaſy and pleaſant to perform, but ſhould not be repeated: unleſs you have another pack of cards which you can adroitly ſubſtitute in the place of the former, and with them you may ſeparate the pictured cards from the others, they being prepared for that purpoſe; which will afford a freſh ſurprize. You may alſo write on a number of blank cards certain letters or words that form a queſtion, and on

others

others the anſwer. Several other recreations may likewiſe be performed by the ſame method.

The metamorphoſed Cards.

IN the middle of a pack place a card that is ſomething wider than the reſt which we will ſuppoſe to be the knave of ſpades, under which place the ſeven of diamonds, and under that the ten of clubs. On the top of the pack put cards ſimilar to theſe, and others on which are painted different objects, in the manner following:

Firſt card	A bird
2	A ſeven of diamonds
3	A flower
4	Another ſeven of diamonds
5	A bird
6	Ten of clubs
7	A flower
8	Another ten of clubs

THEN ſeven or eight indifferent cards; the knave of ſpades, which is the wide card; the ſeven of diamonds; the ten of clubs; and the reſt any indifferent cards.

TWO perſons are then to draw the two cards that are under the wide card, which are the ſeven of diamonds and the ten of clubs. You then take the pack in your left hand, and open it at the wide card, as you open a book, and tell him who drew the ſeven of diamonds to place it in that opening. You then blow on the cards, and without cloſing them you inſtantly bring the card which is at top, and on which a bird is painted, over that ſeven of diamonds—Which to do this dextrouſly you muſt wet the middle finger of your left hand, with which you are to bring the card to the middle of the pack. You then bid the perſon look at his card, and when he has remarked the change, to place it where it was before. Then blow on the cards a ſecond time, and bringing the ſeven of diamonds, which is at the top of the pack, to the opening, you bid him look at his card again, when he will ſee it is that he drew. You may do the ſame with all the other painted cards, either with the ſame perſon, or with him who drew the ten of clubs.

THE whole artifice in this Recreation conſiſts in bringing the card at the top of the pack to the opening in the middle, by

by the wet finger, which requires no great practice. You muſt obſerve not to let the pack go out of your hands while you are performing this Recreation.

The Cards in the Opera Glaſs.

PROVIDE an opera glaſs about two inches and a half long, the tube of which is to be ivory, and ſo thin that the light may paſs through it. In this tube place a lens of two inches and a quarter focus, ſo that a card of about three quarters of an inch long may appear of the ſize of a common card. At the bottom of the tube there is to be a circle of black paſteboard, to which muſt be faſtened a ſmall card with figures on both ſides, by two threads of ſilk, in ſuch manner that by turning the tube either ſide of the card may be viſible.

You then offer two cards in a pack to two perſons, which they are to draw, and that are the ſame as thoſe in the glaſs. After which you ſhew each of them the card he has drawn, in the glaſs, by turning it to the proper poſition.

The better to induce the parties to draw the two cards, place them firſt on the top of the pack, and then, by making the paſs, bring them to the middle. When you can make the paſs in a dextrous manner, it is preferable, on many occaſions, to the long card, which obliges you to change the pack frequently; for otherwiſe it would be obſerved that the ſame card is always drawn, and doubtleſs occaſions ſuſpicion.

The Cards in Tea Caddies.

TWO cards being drawn by different perſons, are put into ſeparate tea caddies and locked up.—The performer changes the cards without touching them, or any confederacy.—

The caddies are made with a copper flap, which has a hinge at the bottom, opens againſt the front, where it catches under the bolt of the lock, ſo as when the lid is ſhut and locked, the flap will fall down upon the bottom; the performer places two cards that he intends to be choſen, between the flap and the front, which being lined with green cloth, may be handled without any ſuſpicion; he then deſires the firſt perſon to put his card into one of the caddies, taking care it be that which contains the contrary card from the one that he choſe, and the ſecond into the other; he then deſires they will lock them up,

which

which unlocks the flaps, covers their cards, and when opened, preſents the contrary ones to the view of the company.

To gueſs the Thoughts of any Perſon, aſſuring him that you will write before-hand, on a Piece of Paper, the amount of the Parcel of Cards he ſhall happen to chooſe out of the two placed on the Table.

TAKE ſome cards, divide them into two parcels, taking care that in one there are only two or three ſevens, and in the other ſeven court cards; call for a pen and ink, and write on a bit of paper the ſevens; then turn the bit of paper down, that what you have written may not be ſeen: then tell the perſon to make his choice. Let him chooſe whatever he pleaſes, your number will be good, ſince, if he ſhould chooſe the greateſt parcel, you may ſhew your paper on which is written the ſevens; then deſire him to count the number of cards contained in the parcel he has choſen, and he will find it to be ſeven, as you had gueſſed, This will appear aſtoniſhing to him and to the company; but they will eaſily recover from their ſurpriſe, when, on raiſing the other parcel, you will ſhew it contains only ſevens, and conſequently whatever parcel he had choſen, your number which you had ſet down was good, ſince one parcel contained ſeven cards, and the other nothing but ſevens.—This trick muſt not be done twice before the ſame company, for then it would become tireſome.—But generally whenever you do a trick before a company, you muſt never begin it again before the ſame.

The Magic Ring.

MAKE a ring large enough to go on the ſecond or third finger, in which let there be ſet a large tranſparent ſtone, to the bottom of which muſt be fixed a ſmall piece of black ſilk, that may be either drawn aſide or expanded by turning the ſtone round. Under the ſilk is to be the figure of a ſmall card.

THEN make a perſon draw the ſame ſort of card as that at the bottom of the ring, and tell him to burn it in the candle. Having firſt ſhewn him the ring, you take part of the burnt card, and reducing it to powder, you rub the ſtone with it, and at the ſame time turn it artfully about, ſo that the ſmall card at bottom may come in view.

The

The Card in the Mirror.

PROVIDE a mirror, either round, or oval, the frame of which muſt be at leaſt as wide as a card. The glaſs in the middle muſt be made to move in the two grooves, and ſo much of the quickſilver muſt be ſcraped off, as is equal to the ſize of a common card. You will obſerve that the glaſs muſt likewiſe be wider than the diſtance between the frame, by at leaſt the width of a card.

THEN paſte over the part where the quickſilver is rubbed off, a piece of paſteboard, on which is a card, that muſt exactly fit the ſpace, which muſt at firſt be placed behind the frame.

THIS mirror muſt be placed againſt a partition, through which is to go two ſtrings, by which an aſſiſtant in the adjoining room can eaſily move the glaſs in the grooves, and conſequently make the card appear or diſappear at pleaſure.

THIS Recreation may be performed without an aſſiſtant, if a table be placed againſt the partition, and the ſtring from the glaſs be made to paſs through a leg of it, and communicate with a ſmall trigger, which you may eaſily puſh down with your foot, and at the ſame time be wiping the glaſs with your handkerchief, that the card may appear the more conſpicuous. It may alſo be diverſified by having the figure of a head, ſuppoſe that of ſome abſent friend, in the place of the card.

MATTERS being thus prepared, you contrive to make a perſon draw the ſame ſort of card with that fixed to the mirror, and place it in the middle of the pack: you then make the paſs, and bring it to the bottom; you then direct the perſon to look for his card in the mirror, when the confederate behind the partition is to draw it ſlowly forward, and it will appear as placed between the glaſs and the quickſilver. While the glaſs is drawing forward you ſlide off the card from the bottom of the pack, and convey it away.

THE card fixed to the mirror may eaſily be changed each time the experiment is performed. This Recreation may be alſo made with a print that has a glaſs before it, and a frame of ſufficient width; by making a ſlit in the frame through which the card is to paſs; but the effect will not be ſo ſtriking as in the mirror.

The divinating perſpective Glaſs.

LET a ſmall perſpective glaſs be made, that is wide enough at the end where the object glaſs is placed, to hold a table ſimilar to the following.

1.131	10. 132	19.133
2.231	11..232	20 233
3.331	12..332	21.333
4.121	13..122	22.123
5.221	14..222	23.223
6.321	15..322	24.323
7.111	16..112	25.113
8.211	17..212	26.213
9.311	18..312	27.313

TAKE a pack of cards that conſiſts of 27 only, and giving them to a perſon, deſire him to fix on any one, then ſhuffle them and give the pack to you. Place the twenty-ſeven cards in three heaps, by laying down one alternately on each heap, but before you lay each card down ſhew it to the perſon without ſeeing it yourſelf; and when the three heaps are finiſhed, aſk him at what number, from 1 to 27, he will have his card appear, and in which heap it then is. Then look at the heap through the glaſs, and if the firſt of the three numbers which ſtands againſt that number it is to appear at, be 1, put that heap at top: if the number be 2, put it in the middle; and if it be 3, put it at bottom. Then divide the cards into three heaps, in the ſame manner, a ſecond and a third time, and his card will then be at the number he choſe.

FOR example. Suppoſe he deſires that his card ſhall be the 20th from the top, and the firſt time of making the heaps he ſays it is in the third heap; you then look at the table in the perſpective, holding it at the ſame time over that heap, and you ſee that the firſt figure is 2, you therefore put that heap in the middle of the pack. The ſecond and third times you in like manner put the heap in which he ſays it is, at the bottom, the number each time being 3. Then looking at the

the pack with your glaſs, as if to diſcover which the card was, you lay the cards down one by one, and the twentieth card will be that he fixed on.

You may ſhew the perſon his card in the ſame manner, without aſking him at what number it ſhall appear, by fixing on any number yourſelf. You may alſo perform this Recreation with the magnetical dial, by making the hand point to any number, from 1 to 27, at which you intend the card ſhall be found.

The foregoing recreations with the cards will be found ſufficient to explain all others of a ſimilar nature, that have or may be made, the number of which is very great. To perform theſe we have deſcribed requires no great practice; the two principal points are, the making the paſs in a dextrous manner, and a certain addreſs by which you influence a perſon to draw the card you preſent.

Thoſe Recreations that are performed by the long card are, in general, the moſt eaſy, but they are confined to a pack of cards that is ready prepared; whereas, thoſe that depend on making the paſs, may be performed with any pack that is offered.

The Dancing Card.

ONE of the company is deſired to draw a card, which the conjurer ſhuffles again with the others, and then orders it to appear upon the wall; the card inſtantly obeys, then advancing by degrees, and according to orders, it aſcends in a ſtraight line, from right to left; it diſappears on the top of the wall, and a moment after it appears again, and continues to dance upon an horizontal line, &c. &c.

EXPLANATION.

This trick is ſo ſimple, that I could have diſpenſed with ſpeaking of it; it conſiſts in the firſt place, in obtaining a forced card drawn, which is eaſily known by the card being larger than the reſt; after having ſhuffled it with the others, it is taken out of the pack, the better to impoſe upon the company: The inſtant it is ordered to appear on the wall, the compeer or inviſible agent very expertly draws a thread, at the end of which is faſtened a ſimilar card, which comes out from behind a glaſs; another thread drawn very tight, on which it ſlides, by the means of ſome very ſmall ſilk rings faſtened, running thereon, preſcribes its motion and progreſs.

Si parva heit componere magnis.

The Card nailed to the Wall with a Piſtol-ſhot.

THE conjurer obtains a card drawn, and requeſts the perſon who has choſen it, to tear off one of its corners, and to obſerve it well to know it again; he takes the card thus torn and tears it all to pieces, burns it, and reduces it to aſhes; he then gets a piſtol loaded with powder, mixed and confounded with the ſaid aſhes, and inſtead of a leaden ball, a nail, marked by one of the company, is put into the barrel; then the pack of cards is thrown up into the air, the piſtol is fired, and the burnt card is found nailed againſt the wall, the piece torn from it is then produced, and found to fit exactly the place from whence it was torn, and the nail is acknowledged to be the ſame, by the perſon who marked it.

EXPLANATION.

A CORNER of the choſen card being torn, the conjurer ſteps into his cloſet, takes a ſimilar card and tears a corner of it exactly in the ſame manner; returning, he aſks for the choſen card, places it ſubtily under the pack, and expertly ſubſtitutes that which he has prepared, in order to burn it in its ſtead; he then lays hold of the piſtol for the firſt time, under pretence of ſhewing how it ſhould be cocked, fired, and handled; one of the company is then deſired to load the piſtol with ſome powder and paper; he ſeizes this interval to convey the card to his inviſible agent, who ſpeedily nails it upon a ſquare piece of board, which ſerves to ſhut up hermetically, a hole made in the partition and the hangings, but which is inviſible, being covered with a piece of the ſame; by this means the card nailed to the wall or partition does not yet appear: the piece of tapeſtry with which it is covered is ſlightly faſtened on one ſide with two pins, and on the other to a thread, the looſe end of which the compeer holds in his hand: As ſoon as this laſt hears the piſtol fired, he draws the thread, and rapidly tranſports the piece of tapeſtry behind the glaſs, the card conſequently appears, and as it is the ſame that had been marked with the nail juſt put into the piſtol, it is no wonder that this trick, ſo difficult to account for, obtains the applauſe of a numerous aſſembly: It depends intirely on firſt loading the piſtol with powder, after which a tin tube is covered on the charge of powder, the card and nail being rammed down in the tin tube; the piſtol being inverted, the tube

and

and its contents fall into the conjurer's hand to convey to his inviſible agent.

N. B. If any one ſhould ſuſpect that the nail in the piſtol has been juggled, his ſuſpicion is proteſted againſt, and he is deſired to come again the next day to be convinced of his error; then he is preſented with a piſtol which is taken to pieces, to ſhew him that there is not the leaſt preparation.

The burnt Card ſhut up in a Watch.

HERE the conjurer preſents the company with a pack of cards, and gets one of them to draw at random; he borrows three watches, which one of the ſpectators is deſired to fold up in three different pieces of paper; they are then laid on a table and covered with a napkin; the choſen card is burnt, and its aſhes are put into a box; ſhortly after the box is opened, but the aſhes are gone: the three watches are laid on a plate, and one of the company is deſired to chooſe one of them and open it, in which he finds under the glaſs a piece of the burnt card, and under the watch-caſe, a ſmall card repreſenting in miniature, that reduced to aſhes.

EXPLANATION.

The choſen card is known directly by the diſpoſition of the pack; the watches well enveloped in paper, are laid on the little trap, which opens and lets it fall into a drawer; as ſoon as the compeer is acquainted with the card drawn, he ſtretches out his arm under the table and takes one of the watches, in which he depoſits the card, deſtined to be produced before the company: The watches ſhould be covered with a napkin, ſuſtained by ſeveral bottles, or ſomething ſimilar, otherwiſe the compeer's hand would be perceived moving the napkin. The three watches are preſented to a by-ſtander upon a plate, with care to turn next to him that which contains the card in miniature, and which is marked by having a little of its corner torn: If the perſon ſhould be cunning, and waggiſhly affects to take the watch next to him, he is deſired to mix and confound them well together, under the pretence of embelliſhing the trick, and the ſtratagem is put in execution. The method of cauſing the aſhes of a burnt card to diſappear in a box, conſiſts in depoſiting a bit of wood or paſteboard within the lid, which fills it exactly in length and breadth, and which nevertheleſs is looſe enough to fall down into the

bottom of the box, when it is ſhut; the piece of wood or paſteboard being of the ſame colour as the inſide of the box, forms a double bottom, hides the aſhes from the eyes of the dazzled ſpectator, who in the ſame moment is induced to think that the aſhes are taken out in order to be combined anew, to produce the card in miniature, which is found in the watch.

The Cards named, diſcovered with the Eyes blinded.

A PACK of cards are cauſed to be drawn by ſome perſon: A woman arriving in the room, names all the cards juſt drawn, without making the leaſt miſtake with regard to their colour, number, &c.

EXPLANATION.

THE cards are diſpoſed as we obſerved before. The conjurer having, unnoticed, obſerved the card drawn, he informs his wife, or agent, even at the very inſtant he promiſes he will take particular care he or ſhe ſhall know nothing about it. He ſays he will not ſpeak a word, while his wife names the cards, and that the perſon who holds them ſhall be confined to ſhew them to the company, by ſaying this is ſuch or ſuch a card, &c. It is in this laſt phraſe he names the card, which is underneath; his wife, who hears him, and who knows by heart the diſpoſition of the pack, names the cards which follow it; that is to ſay, for inſtance, if ſhe is given to underſtand that the 19th is underneath, ſhe names the 10th, the 17th, &c. Having mentioned the whole pack, her huſband, who, during this time, never ſpeaks a word, reſumes the uſe of his ſpeech, and begs of the perſon who had choſen them, to aſk what are the others that remain un-named; the wife is informed by this queſtion, that there is not one remaining, and anſwers accordingly.

The Card ſpringing up into the Air, from the Pack, without being touched.

ONE of the cards is drawn, which is afterwards put in and ſhuffled with the reſt of the pack; then the pack is put into a kind of ſquare ſpoon, placed upright upon a bottle, which ſerves it as a pedeſtal, and at the company's pleaſure the card inſtantly flies up into the air.

EXPLANATION.

IN the firſt place, a forced card muſt be choſen, in the manner deſcribed; then the pack muſt be placed in the ſpoon, ſo that the choſen card may lean on a pin, bent in the form of a hook;

hook; this pin is faſtened to a thread, and aſcending through the pack, leans upon the upper end of the ſpoon; then it deſcends under the room, through the table. In this diſpoſition the compeer cannot pull the thread without dragging along with it the hook and card, which cauſes it to be perceived as flying in the air. The thread ſlides upon the blunt edge of the ſpoon as eaſily as if it run in a pully.

In order to place the cards in the ſpoon quick enough, that the ſpectators may perceive no preparation, care muſt be taken that another pack is preſented dextrouſly on the table. The choſen card in the other, with the hook and thread, muſt be previouſly prepared as above deſcribed.

The burnt Writing reſtored.

COVER the outſide of a ſmall memorandum book with black paper, and in one of its inſide covers make a flap, to open ſecretly, and obſerve there muſt be nothing over the flap but the black paper that covers the book.

Mix ſoot with black or brown ſoap, with which rub the ſide of the black paper next the flap: then wipe it quite clean, ſo that a white paper preſſed againſt it will not receive any mark.

Provide a black lead pencil that will not mark without preſſing hard on the paper. Have likewiſe a ſmall box, about the ſize of the memorandum-book, and that opens on both ſides, but on one of them by a private method. Give a perſon the pencil, and a ſlip of thin paper, on which he is to write what he thinks proper: you preſent him the memorandum book at the ſame time, that he may not write on the bare board. You tell him to keep what he writes to himſelf, and direct him to burn it on an iron plate laid on a chafindiſh of coals, and give you the aſhes. You then go into another room to fetch your magic box before deſcribed, and take with you the memorandum-book.

Having previouſly placed a paper under the flap in the cover of the book, when he preſſes hard with the pencil to write on his paper, every ſtroke, by means of the ſtuff rubbed on the black paper, will appear on that under the flap. You therefore take it out, and put it into one ſide of the box.

You then return to the other room, and taking a ſlip of blank paper, you put it into the other ſide of the box, ſtrewing the aſhes of the burnt paper over it. Then ſhaking the box

for

for a few moments, and at the ſame time turning it dextrouſly over, you open the other ſide, and ſhew the perſon the paper you firſt put in, the writing of which he will readily acknowledge to be his.

THERE may likewiſe be a flap in the other cover of the book, and you may rub the paper againſt that with red lead. In this caſe you give the perſon the choice of writing either with a red or black pencil; and preſent him the proper ſide of the book accordingly.

The Opaque Box rendered Tranſparent.

MAKE a box of three or four inches long, and two or three wide, and have a ſort of perſpective glaſs, the bottom of which is of the ſame ſize with the box, and ſlides out, that you may privately place a paper on it. The ſides of this perſpective are to be of glaſs, covered on the inſide with fine paper.

LET a perſon write on a ſlip of paper, putting your memorandum-book under it, as in the laſt Recreation. Then give him the little box, and let him put what he has wrote into it. In the mean time you put the memorandum-book into the preſs, where the perſpective is already placed. Your aſſiſtant then takes the paper out of the book, and puts it at the bottom of the perſpective; which you preſently take out of the preſs, and direct the perſon to put the little box, that contains his paper under it. You then look in at the top of the perſpective; and feigning to ſee through the top of the box, you read what is wrote on the paper at the bottom of the perſpective.

WITH this perſpective box you may perform another recreation, which is, by having in a bag twelve or more ivory counters, numbered, which you ſhow to the company, that they may ſee all the numbers are different. You tell a perſon to draw any one of them, and keep it cloſe in his hand. You then put the bag in the preſs, when your aſſiſtant examines the counters, and ſees which is wanting, and puts another of the ſame number at the bottom of the perſpective, which you then take out; and placing the perſon's hand cloſe to it, look in at the top, and pretending to ſee through his hand, you name the number on the counter in it.

The penetrative Guinea.

PROVIDE a round tin box, of the ſize of a large ſnuff-box, and in this place eight other boxes, which will go eaſily into each

each other, and let the leaſt of them be of a ſize to hold a guinea. Each of theſe boxes ſhould ſhut with a hinge, and to the leaſt of them there muſt be a ſmall lock, that is faſtened with a ſpring, but cannot be opened without a key: and obſerve that all theſe boxes muſt ſhut ſo freely, that they may be all cloſed at once. Place theſe boxes in each other, with their tops open, in the drawer of the table on which you may make your experiments; or if you pleaſe, in your pocket, in ſuch manner that they cannot be diſplaced.

THEN aſk a perſon to lend you a new guinea, and deſire him to mark it, that it may not be changed. You take this piece in one hand, and in the other you have another of the ſame appearance, and putting your hand into the drawer you ſlip the piece that is marked in the leaſt box, and ſhutting them all at once, you take them out. Then ſhowing the piece you have in your hand, and which the company ſuppoſe to be the ſame that was marked, you pretend to make it paſs through the box and dextrouſly convey it away.

You then preſent the box, for the ſpectators do not yet know there are more than one, to any perſon in company, who when he opens it, finds another, and another, till he comes to the laſt, but that he cannot open without the key, which you then give him, and retiring to a diſtant part of the room, you tell him to take out the guinea himſelf, and ſee if it be that he marked.

THIS recreation may be made more ſurpriſing, by putting the key into the ſnuff-box of one of the company, which you may do by aſking him for a pinch of ſnuff, and at the ſame time conceal the key, which muſt be very ſmall, among the ſnuff: and when the perſon who is to open the box aſks for the key, you tell him that one of the company has it in his ſnuff box. This part of the recreation may likewiſe be performed by means of a confederate.

An artificial Memory.

THE reader muſt have obſerved, that to perform ſeveral of the recreations in this book; it is neceſſary to have a good memory; but as that is a gift every one has not from nature, many methods have been contrived to ſupply that defect by art; the moſt material of which we ſhall here deſcribe.

AN artificial memory reſpects either figures or words: for the former let the five vowels *a, e, i, o, u*, repreſent the firſt five digits; the dipthongs that begin with the firſt four vowels, as *au, ea, ie, ou*,

ou, represent the remaining four digits, and let *y* stand for an o, or cypher. Let the ten first consonants also stand for the nine digits and the cypher; as in the following table.

a	*e*	*i*	*o*	*u*	*au*	*ea*	*ie*	*ou*	*y*
1	1	3	4	5	6	7	8	9	o
b	*c*	*d*	*f*	*g*	*h*	*k*	*l*	*m*	*n*

THEN to represent any number let the first letter be a vowel or dipthong, the second a consonant, the third a vowel, the fourth a consonant, &c. Thus for the number 1763, you write or remember the word *akaud*. If there are several sums to be retained, you place the words in forms of verses, which will make them more pleasing to repeat and more easy to remember: for example, if you would remember the dates of the accession of the family of Stuart to the crown of England; the powder plot; the decapitation of Charles I; the Restoration; the Revolution; the Union of England and Scotland; the accession of the House of Hanover; and the last rebellion, which were in 1603, 1605, 1649, 1660, 1689, 1707, 1714, and 1746, you write as follows, for you are to observe that in this, and in similar cases, where the first figure is always the same, it is unnecessary to write it after the first time.

Ahyd hyg ham haun
hiem kyk kaf koh.

THIS method is rendered in some instances still more easy by adding parts of words to dates: thus to remember the date of the accession of the monarchs from James I. to the present king, you may write as follows, omitting the letter that would stand for one thousand.

Jam*hyd* Char*heg* Char*hom* Jam*hieg*
Will*hiem* An*kyc* Geor*kaf* Sec*kek* Thi*kaun*

WHEN several cyphers come together, instead of repeating *y* or *n*, you may write *y* or *n* 2, 3, &c. Thus for 3400 write *ify2*, and for 256000 write *ehun3*.

To remember any number of words, select the initial letters of those words, and to the first add *a* if it begins with a consonant, or *b* if it begins with a vowel. In like manner add *e* or *c* to the second initial letter; to the third add *i* or *d*; to the fourth *o* or *f*; and to the fifth *u* or *g*. So that of the five initials you make five

five ſyllables, which are joined together in one word. Then of the next five initials you make, in the ſame manner, another word, and of every two words you make a verſe. For example, ſuppoſe you would remember the names of all the kings ſince the Conqueſt, in the order in which they reigned, you then write as follows.

*W*awehiſohu	*R*ajehiefeg
*E*brehihohu	*E*beerihohu
*E*bmeedjocu	*C*ajewiaſgu *G*age

Or if you would remember the letters that begin any number of verſes, ſuppoſe the twenty firſt lines of Pope's Eſſay on Man, you write as follows.

*A*btelitoeg	*A*bacodtotu
*T*aocedaflu	*B*aſewioffu.

The Handkerchief marked, cut, torn, and mended.

TWO perſons of the company are deſired to ſtep forwards; a handkerchief is given them, which they are to hold by the four corners; ſeveral other handkerchiefs are aſked from the company, and as they are received, they are put within the firſt, in order to make them a bundle; when there are about a dozen of them heaped up together, the two perſons who hold the bundle, cauſe one of them to be drawn at random, by a third ſpectator; this laſt is deſired to examine its mark and number, if any ſuch there be, and to cut off one of the corners, with a pair of ſciſſars; any one may cut a piece alſo; after that the handkerchief is torn in pieces: The bits and ſcraps being gathered together, on which are poured certain pretended drugs or liquors, all are folded and firmly bound with a riband, in order to reduce them to a ſmall parcel, then they are put under a glaſs; a few moments after the handkerchief is taken to be unfolded, and every body acknowledges the mark, and the ſpectators are ſurprized to ſee it has not received the leaſt damage in the operation.

EXPLANATION.

This operation which produces ſo general an illuſion is very ſimple. One of the company with whom the juggler is acquainted, having two handkerchiefs perfectly alike, having previouſly depoſited one of them in the hands of the compeer concealed behind the curtain, throws the other upon the floor

to

to perform the trick with: The operator takes care to put this handkerchief uppermoſt in making the bundle, though he affects to mix them together promiſcuouſly; the perſon whom he deſires to draw one of the handkerchiefs, takes naturally that which comes firſt to hand; he deſires to ſhake them again, on pretence to embelliſh the operation: The juggler having ſhook them over again himſelf, to bring the right handkerchief uppermoſt, deſires ſomebody leſs penetrating, whoſe mien denotes ſimplicity, and who in putting his hand into the bundle, takes without ceremony the firſt that preſents itſelf. When the handkerchief is torn and carefully folded up, it is put under a glaſs, on a table placed near a partition; in that part of the table on which it is depoſited, is a little trap, which opens, and lets it fall into a drawer; the compeer hid behind the curtain paſſes his hand within the table, opens the trap, and ſubſtitutes a ſecond handkerchief inſtead of the firſt, then ſhuts the trap, which fits ſo exactly the hole it cloſes, it ſeems one and the ſame piece with the ſurface of the table; and deceives by this means the eyes of the moſt incredulous and penetrating ſpectator.

The Artificial Bird, ſinging at the Company's command.

THIS bird perched on a bottle, ſings without any preliminary exerciſe, any tune demanded of him, even compoſed upon the ſpot, by the moſt conſummate muſicians: He ſings equally as well when tranſported from one bottle to another upon different tables: The wind iſſuing out of his beak is ſtrong enough to extinguiſh a candle, and to relight it; this may be done when he is even taken away from the bottle and held in the hand.

EXPLANATION.

BEHIND the curtain, a part of which covers the partition, are two hollow metal cones, theſe cones which are unequal, ſerve the compeer as a ſpeaking trumpet, in the ſame manner as the ſpeaking figure ſometimes exhibited in *London*. The compeer imitating the voice of a bird, as the celebrated *Roſſignol*, and follows the tunes which the muſicians play by heart, or from a muſic book laid before them; if the tune propoſed ſhould be too difficult for the muſicians and the compeer to execute, without previous exerciſe, the company is informed, that to render the trick more ſurpriſing, the bird will

will begin, by ſinging ſome tune well known, from which it will paſs ſuddenly to the tune in queſtion: This is done to gain time; ſome of the muſicians avail themſelves of the interval, by obſerving more particularly the muſic, and the compeer makes uſe of the two different echoes, to convey his voice to two different points, according to the table and bottle on which the bird ſtands. The bird contains in its belly a little double pair of bellows, like thoſe of a ſerenata, and between its feet is a moveable pin which works the bellows; this pin in entering the neck of the bottle, leans on a piece of wood, which cannot be perceived, from the bottle's opacity: This piece laying vertically on the moveable bottom of the bottle, can eaſily move the bellows, and be made to move by the engines placed under the carpet, when the compeer draws the wire concealed in the feet of the table; by this means the bellows are moved to extinguiſh the candle, and to convince the ſpectators that the voice is really formed in the bird's throat by the wind that iſſues forth from the beak. When the conjurer takes the bird in his hand, he works the bellows himſelf with his thumb, and the wind extinguiſhing the candle, perſuades the company that the bird ſings, independent of the machine concealed in the table and behind the partition: The candle being but juſt extinguiſhed, and the wick ſtill hot, cannot poſſibly approach the bird's beak without being illuminated; for care is taken to put a little flour of brimſtone in it, which produces the effects of a match.

The Piece of Money ſhut up in a Box, from whence it eſcapes without its being touched.

ONE of the company is intreated to hold a box, into which a piece of money or a ring is depoſited in his preſence; the conjurer withdraws from the perſon, and begs of him to ſhake the box a little, when the piece is conſequently heard to rattle within. At the third ſhake it is ſtill heard, but at the fourth, it is no more in the box, for it is found in the ſhoe of one of the company.

EXPLANATION.

EVERY conjurer carries a quantity of theſe boxes about for ſale; that which cauſed ſo much admiration differs from the others only in being a little better made, and belonging to a man who knows how to embelliſh his tricks by all ſorts of

favourable circumſtances. This box is made ſo, that in ſhaking it ſoftly up and down, you hear the piece it contains —but in ſhaking it ſtrongly in an horizontal direction, a little ſpring falls upon the piece, and hinders it from ſounding, which excites the opinion of its being no more therein. He who does the trick, then touches the box, on pretence of ſhewing how it ſhould be ſhaken; and though it be locked, the piece drops into your hand, through a little chink, which opens ſecretly. He leaves the box with the ſame perſon, and cauſes the company to imagine the piece is ſtill in the box, or it is not according to the manner in which it is ſhaken. In fine, he cauſes the piece to be found in the ſhoe of a perſon who is, or is not, in correſpondence with him, and has furniſhed him with a ſimilar piece; or by ſending ſome perſon to ſlip it dexterouſlly over the floor. In this laſt caſe it is found on the ground only, and the perſon is made to believe that he let it fall in taking off his ſhoe.

The Writing concealed in a Snuff Box, from whence it is taken out, without touching the Box, and found in a Wax Candle.

THE conjurer borrows a ſnuff box from one of the company, who he deſires to write a phraſe of his own choice, on a little piece of paper. This writing is put into the box; another perſon ſoon after takes it out, reduced to aſhes, and at laſt, it is cauſed to be found in a wax candle, at the choice of one of the ſpectators.

EXPLANATION.

THE box borrowed ſhould be neither gold, ſilver, nor hinged. A plain round box of paſteboard will ſuffice, of which the inſide is blackiſh, and whoſe lid may be taken off. While the ſpectator writes the phraſe, the lid is conveyed away into the adjacent cloſet. It is quickly placed there upon a ſheet of lead, which is cut round with a pair of ſciſſars, to make a double bottom. It is put into the lid with a little piece of paper, folded up in four, hid underneath it. The conjurer returns, and gets the written paper folded up, in the ſame manner as that concealed in the lid. The ſpectator is deſired to put his writing in the ſnuff box; then it is covered, and the double bottom, which the lid contains, falls into the box, hides the writing and leaves viſible only the other paper. In taking this paper, in order to burn it, the ſpectator is duped, for he innocently

innocently leaves his writing in the box. Then he is desired to put this false paper into a tin shovel, and to present it to the flames, in order to burn it, and to hold it at a certain distance to heat slowly. This last circumstance is only a pretence to gain time, while the conjurer carries the box and the writing to his closet: he has there a wax candle prepared, of which one end, like those of church tapers, is pierced with an iron of a conic form. It is in this hollow cone he puts hastily the writing in question, and fills up the aperture with some warm wax, the better to incorporate with the candle. He mixes and confounds this candle with several others, and causes it to be chosen preferably, by means of the stratagem mentioned before.

The same means are employed to produce the writing in an orange, a guinea in a casket, or a lemon, &c. &c.

Three Pen Knives having been put into a Silver Cup, one of which jumps out at the Command of any of the Spectators.

THREE pen knives are borrowed from different persons of the company; they are put into a cup which stands upon a table; it is shewn that the table has no communication with the cup, and that this last contains no kind of preparation; nevertheless, one of the knives, at any one of the spectator's desire, jumps upon the ground, and the other two remain motionless.

EXPLANATION.

When the cup is laid upon the table, a half crown piece is slipt into the bottom of it, fastened in the middle to a small black silk thread. This thread mounts perpendicularly to the ceiling, and goes to join the hand of the compeer, who draws the thread upon a moment's notice, and dexterously makes that pen knife jump out of the middle, which was the only one placed on the half crown piece; the others fall immediately to the bottom of the cup.

The Dance of the Egg.

THREE eggs are carried into the room; two are laid upon the table; the third is put into a hat. A little cane, or a switch, borrowed from one of the company, which is shewn not to have been in any manner prepared, is laid across the hat; at the same instant the hat falls upon the ground, the egg adheres

faſt to the cane, as if it were glued to it; then the muſic begins to play, and the egg, as if ſenſible of the harmony, ſlips in turning from one end of the cane to the other, and continues to move till the muſic ceaſes.

EXPLANATION.

THE egg is faſtened to a thread, with a little peg, put in lengthways, and which leans tranſverſly upon the inſide ſurface of the ſhell. The hole made to introduce the peg, is ſtopt up with a little white wax. The other end of the thread is faſtened to the conjurer's cheſt of his body, with a pin bent in the form of a hook; the cane paſſing underneath the thread, very near the egg, ſerves to ſupport it. As ſoon as the muſic begins, the conjurer puſhes the cane from left to right, or from right to left, and moves his body unperceived, and at the firſt ſight the egg ſeems to run along the cane, without any viſible aſſiſtance; but this is only a deluſion of the ſight, for it is conſtantly faſtened to the thread; its centre of gravity remains always at the ſame diſtance from the hook which retains it; it is the cane, which in ſliding preſents, ſucceſſively, its different points to the ſurface of the egg, as it moves or dances.

Of the Bird's Death and Reſurrection.

THE egg choſen out of the three, to dance on the cane, being broken, but preſently changed by the conjurer to the real egg, to ſhew that it had not been previouſly prepared, the two others left upon the table are taken up; one of which is choſen by a ſpectator, and in breaking, out flies a living canary bird. A lady of the company is deſired to take the bird into her hand, and ſoon after it is found to be dead. Then it is taken from her and laid under a glaſs upon a table; ſome minutes after the glaſs is taken off, and the bird flies away.

EXPLANATION.

TWO eggs are emptied, and the half of the ſhells are taken and adjuſted together with two little ſtrips of paper, glued in the form of a zone, or an equator. Being thus prepared, they repreſent an egg, and can contain a little living canary bird, provided a little hole be made in it with a pin, to permit its free reſpiration.

THE inſtant this bird is delivered into the hands of a perſon who condeſcends to hold it, the conjurer ſtifles it by a hard

ſqueeze

ſqueeze between his finger and thumb. It is then put under a glaſs, upon the trap before mentioned, that the compeer may place a living one in its ſtead.

The Golden Head on three Rings, Dancing and jumping in a Glaſs, to anſwer different Queſtions.

TO ſhew that this head is deſolate and void of communication, ſeveral crown pieces are placed in the bottom of a glaſs, covered with a cloſe lid, which notwithſtanding does not hinder this head, deſcribed to be of maſſy gold, to jump into the glaſs, to anſwer many queſtions propoſed. At the ſame time a bunch of rings, ſeen in another glaſs at a little diſtance, perform the ſame motions, as by ſympathy.

EXPLANATION.

A SECOND head is put in the place of the firſt ſhewn to the company, and taken off the table on which the operation is to be made. This ſecond head is faſtened to a ſilk thread, which paſſing through the table, reaches under the floor to join the compeer, who dances either the rings, or head, at pleaſure, in order to correſpond properly with the conjurer; and the rings jump in like manner at pleaſure.

The Rings paſſed on a Double Ribbon.

IN a great number of rings furniſhed by the company, two ribbons are introduced, of which the ends are given to two couple of the ſpectators to hold; ſoon after, without hurting the ribbons, and without taking off the rings over either of the ends, they are looſed from the ribbons, and returned to their owners.

THESE ſtrings or ribbons, with the balls, or beads, are ſold at moſt toy-ſhops in London, as well as many other commodities for ſuch kind of experiments.

EXPLANATION.

Ozanam, about a century ſince, publiſhed, in his mathematical recreations, the manner of doing this trick; it is known by all conjurers by the name of *my grandmother's beads*, from their uſing little balls inſtead of rings: To perform this trick with ſucceſs, firſt double one of the ribbons, ſo that the two ends of it touch one another; do the ſame with the ſecond, and then faſten them both together, with a thread of

the ſame colour round their middle. This being previouſly prepared, when you are going to perform the trick, give one of the ſpectators the two ends of the ribbon to hold, and thoſe of the ſecond to another, by this means their eyes are deceived; each thinking he holds in his hand the extremities of two different ribbons, but it is quite otherwiſe; for if in this poſition they were to pull hard enough to break the thread, the ribbons would conſequently ſeparate, and the rings fall upon the ground: But to avoid this accident, and to finiſh the trick with ſucceſs, you muſt beg of them to approach one another, and aſk each of them to give one of the ends they hold; involve them together ſo as to make a knot, and render to each, that which the other held before; by this means each of them then hold the extremities of two different ribbons: Soon after the cheat can no longer be perceived, the rings which have never been paſſed on both ribbons are taken off much more eaſily when the thread is broken, and the ſpectator who thought them really paſſed on both, is ſurpriſed to ſee them diſengaged.

The Sympathetic Lamp.

THIS lamp is put upon a table; the conjurer gives a ſignal to the compeer to blow in a pipe, without directing the wind to the place where it is laid, and nevertheleſs it extinguiſhes it immediately, as if ſome perſon had blown it out.

EXPLANATION.

THE candleſtick which bears the lamp, contains a pair of bellows in its baſis, by which the wind is conveyed ſtraight to the flame through a little pipe. The compeer, under the floor, or behind the curtain, in moving the machinery, concealed under the table, makes the bellows blow to extinguiſh the lamp in the moment deſired.

The Little Huntſman.

IT is a little image about the ſize of the little turk. It holds a bow in its hand, with an arrow, which is ſhot the very inſtant the company think proper, and ſtrikes a paſteboard marked and placed on the top of a column. This paſteboard is divided into ſeveral circles, which are numbered, and the arrow always enters a number previouſly choſen by one of the ſpectators.

EXPLANATION.

EXPLANATION.

THE action of the ſpring, which puſhes the arrow is retained for a moment, by a pin, which the compeer takes off at pleaſure, in moving the machinery, concealed in the table. When this pin is puſhed, the ſhaft flies rapidly towards the paſteboard, as the cock of the piſtol falls upon the hammer when one draws the trigger.

IN laying the automaton on the table, it muſt be placed ſo, that the arrow points exactly at one of the numbered circles, which will be the eaſier done, the leſs this is diſtant from the mark. To cauſe the number to which the dart is pointed to be choſen, forced cards muſt be preſented to one of the ſpectators, who muſt, according to art, chooſe the number in queſtion. This depends upon a particular addreſs of the conjurer, very difficult to be deſcribed by words. However it may be ſaid in general to conſiſt, firſt, In putting the card pitched upon under the pack; ſecondly, On keeping it always in the ſame place, though one ſhuffles, or ſeems to ſhuffle the cards, to make people think that neither of the cards has been ſeen. Thirdly, To paſs this card into the middle of the pack, the very inſtant it is preſented. Fourthly, On making ſeveral cards paſs before the ſpectator's hand, to cauſe him to think he may chooſe either of them indifferently. Fifthly, In making theſe cards paſs rapidly, that he may not have time to take any other. In fine, in ſlipping dexterouſly the card intended into his hand, intreating him at the ſame time very civilly, in order to deceive him, to take which he pleaſes; for it requires no ſmall ſhare of impudence to perform experiments of this kind.

The Ball thrown into the little three doored Houſe, and iſſuing from either at Command.

EXPLANATION.

AN inclined pipe, in which the ball rolls downwards, has in its lower part, at different heighths, two holes, which are ſhut by valves opened by the compeer's playing the machinery under the ſtage. Theſe two holes, from the opening and extremity of two other pipes, which reach the one to the right, the other to the left, to two different doors; the firſt pipe reaches to the middle door. If it be deſired that the ball ſhould iſſue from the right hand door, the compeer plays the machinery

machinery to open the firſt valve which the ball meets in coming down. This valve being open, the ball naturally falls into the ſecond tube, which conveys it to the right hand door.

If it be deſired that the ball ſhould paſs at the left hand door, the compeer, by means of another piece of machinery, opens the ſecond valve, and the ball paſſing over the firſt, which is ſhut, neceſſarily falls into the third tube, which conveys it to the door demanded. In ſhort, if it be deſired that the ball ſhould come out at the middle door, the compeer has nothing to do; becauſe the ball runs directly to it, in following the firſt tube, without falling into either of the two others.

Theophraſtus Paracelſus; or, The Pigeon killed by the Thruſt of a Sword given to its Shade or Image.

THE name of *Theophraſtus Paracelſus*, is given to this trick, becauſe it is pretended, that a man ſo called killed his brother, by ſtabbing his picture with a dagger. This anecdote, which undoubtedly is not related by cotemporary hiſtorians, nor by eye witneſſes, ſhould be conſidered without doubt, as apocryphal. However, the trick in queſtion conſiſts in faſtening a pigeon by the neck to a double ribbon, drawn very tight, and ſuſtained by two columns; and in cutting off the animal's head without touching it, in the very inſtant the ſword is thruſt at, or drawn againſt the ſhadow of the bird.

EXPLANATION.

The two double ribbons to which the pigeon is faſtened, conceal a very ſharp little ſteel blade, bent in the form of a ſickle. The blade is faſtened to a ſilk ſtring, which, paſſing between the two ribbons, and through one of the columns, reaches the hands of the compeer, underneath the floor. The pigeon's neck ſhould be controuled by a kind of a ſilken ring, to hinder it from advancing or retreating. He who performs the trick, draws his ſword upon the bird's ſhadow, and at this inſtant giving a hard ſtamp with his foot, as a ſignal for the compeer to draw the ſtring, cauſes the ſickle, which embraces the pigeon's neck, to cut off its head.

The

The Magic Noſegay blowing at the Word of Command.

EXPLANATION.

THE branches of this noſegay may be made of rolled paper, of tin, or any other matter whatever, provided they be hollow or empty. They muſt, in the firſt place, be pierced in ſeveral places, in order to apply to them little maſſes of wax, repreſenting flowers and fruits. Secondly, this wax muſt be enveloped with ſome gummed taffety, or a very thin gold beater's ſkin. Thirdly, theſe envelopings muſt be quickly glued to the branches, ſo as to ſeem a part of them, or at leaſt a prolongation. Fourthly, the colours of the flowers and fruits they repreſent, muſt be given them. Fifthly, the wax muſt be heated till it melts, and runs down the branches and handle of the noſegay.

AFTER this preparation, if you pump the air through the ſtem of the noſegay, the envelopings will of courſe contract themſelves, ſo as to appear withered, &c. and as you blow, the wind penetrating into the ramifications of the branches, the envelopings, like little æroſtatical balloons, dilate themſelves ſo as to reſume their primitive and blowing appearance.

To perform this trick you muſt begin by twiſting and dreſſing lightly all theſe envelopings, and render them almoſt inviſible, by making them to enter into the branches of the noſegay: then the noſegay muſt be placed in a kind of bottle, containing a little pair of bellows, and of which the moveable bottom being put in motion, by the machinery in the table, may ſwell the envelopings at the moment required.

The Ring in a Piſtol, found afterwards in the Beak of a Turtle Dove, in a Box previouſly viſited, and ſealed up.

ONE of the company is deſired to put his ring into a piſtol, loaded by one of the ſpectators. An empty box is ſhewn to the company, which is cauſed to be ſhut by a third perſon, who faſtens it with a ribbon which he ſeals with his own arms. Then this box is put upon a table, of which the company never loſe ſight; nevertheleſs, after having fired the piſtol, on opening the box, this ſame ring is diſcovered in the beak of a dove.

EXPLANATION.

EXPLANATION.

On pretence to ſhew how to handle the piſtol, the conjurer lays hold of it, and dexterouſly withdraws the ring, in the ſame manner he did the nail ſpoken of before. It is carried to the compeer who puts it directly in the beak of a tame dove; he then extends his arm to the inſide of the table, placed near the partition, in order to open the trap mentioned before, and puts the bird into the box, of which the bottom opens ſecretly. The ſealed ribbon which ſurrounds the box, cannot hinder it from opening, becauſe it is done only by one half of the bottom opening inſide inſtead of outſide; and great care is before taken, not to make a ſecond turn with the ribbon, which croſſing the firſt, would oppoſe the introduction of the dove.

We ſhall not mention here the means for making ſuch a box, for it would not only require a long diſcourſe to explain, ſince there is not a Joiner, Eboniſt, or Cabinet-Maker of any intelligence, who does not invent, or know, ſeveral ſecrets of this kind.

The Coffer that opens at Pleaſure.

EXPLANATION.

THIS coffer contains a puppet, whoſe carcaſe forms a kind of a pudding ſpring, *i. e.* a wire wound up in a ſpiral form; thus the little image, though higher than the coffer, may ſtand upright therein, when it is ſhut, as its body is contracted by preſſure. The coffer leans upon the machinery, which has a communication with the bolt of the lock, and the centre of the table. When the bolt is diſengaged from the ſtaple, the above ſpring finding no other reſiſtance than the weight of the lid, forces it eaſily to riſe. This the inviſible agent can always perform in concert with the conjurer.

The Watch pounded in a Mortar.

A WATCH is borrowed from one of the company, which is immediately put into a mortar. Some moments after, another perſon is deſired to break it, the wheels, the fuſee, the ſpring, and the barrel are ſhewn cruſhed and fractured; finally, in a few minutes after, the watch is returned to the lender uninjured, who acknowledges it to be his own.

EXPLANATION.

EXPLANATION.

In order to ſucceed, and produce an illuſion in doing this trick, care muſt be taken to put into the mortar a ſecond watch, whoſe hands, chain, and trinkets, reſemble in ſome meaſure thoſe of the firſt, which is not very difficult, becauſe we may be acquainted with the perſon who lends the watch, or addreſs ourſelves to a perſon, whoſe watch we have had an opportunity elſewhere to examine.

After having replaced the fractured watch in the mortar, the company muſt be amuſed an inſtant with a new trick, while all the pieces are gathered out of the mortar, and the firſt watch placed in their room.

A Piſtol loaded with Powder and Ball, and diſcharged at any Perſon, who dexterouſly receives the Ball on the point of a Knife.

THE conjurer preſents one of the company with a common piſtol, ſome powder, and a real leaden ball, to load. The conjurer then, at the diſtance of ſix yards, deſires the perſon to cock the piſtol, and diſcharge it at him, who holds a knife immediately directed to the mouth of the piſtol, and thus catches the ball on the point of the ſaid knife.

EXPLANATION.

The ſtratagem in the latter end of a former experiment, is alſo uſed in the above, in which a ball is fixed inſtead of a nail, excepting, that the conjurer has a double-headed knife, on one of which blades is previouſly fixed a ball, which is concealed by his hand; and the moment the piſtol is fired, this ball is expoſed to the obſervance of the audience, as if inſtantaneouſly caught from the ſaid piſtol's diſcharge.

The Myſtical Dial.

ON a piece of ſquare paſteboard ABCD (Plate I. Fig. 3.) draw the circle EFGH, and divide it into twenty-ſix equal parts, in each of which muſt be wrote one of the letters of the alphabet.

On the inſide of this there muſt be another circle of paſteboard, ILMN, moveable round the centre O, and the extremity of this muſt be divided into the ſame number of equal parts as the other. On this alſo muſt be wrote the letters of the alphabet, which, however, need not be diſpoſed in the ſame order.

order. The perſon with whom you correſpond muſt have a ſimilar dial, and at the begining of your letter you muſt put any two letters that anſwer to each other when you have fixed the dial.

EXAMPLE.

Suppoſe you would write as follows:

If you will come over to us you ſhall have a penſion, and you may ſtill make a ſham oppoſition.

You begin with the letters *Ma*, which ſhew how the dial is fixed; then for *If you*, you write *un juc*, and ſo for the reſt, as you will ſee at the bottom of the plate.

THE ſame intention may be anſwered by a ruler, the upper part of which is fixed and the lower part made to ſlide: but in this caſe the upper part muſt contain two alphabets in ſucceſſion, that ſome letter of that part may conſtantly correſpond to one in the lower part. The diviſions ſtanding directly over each other in a ſtraight line will be much more obvious than in the circumference of a circle. Or two ſtraight pieces of paſteboard regularly divided, the one containing a ſingle and the other a double alphabet, would anſwer exactly the ſame purpoſe. In this caſe a blank ſpace may be left at each end of the ſingle alphabet, and one or two weights being placed on both the pieces will keep them ſteady.

The Correſponding Spaces.

TAKE two pieces of paſteboard or ſtiff paper, through which you muſt cut long ſquares, at different diſtances, as you will ſee in the following example. One of theſe pieces you keep yourſelf, and the other you give to your correſpondent. When you would ſend him any ſecret intelligence, you lay the paſteboard upon a paper of the ſame ſize, and in the ſpaces cut out, you write what you would have underſtood by him only, and then fill up the intermediate ſpaces with ſomewhat that makes with thoſe words a different ſenſe.

I shall be much obliged to you, as reading alone engages my attention at present, if you will lend me any one of the eight volumes of the Spectator. I hope you will excuse this freedom, but for a winter's evening I don't know a better entertainment. If I fail to return it soon, never trust me for the time to come.

A PAPER of this sort may be placed four different ways, either by putting the bottom at top, or by turning it over, and by those means the superfluous words may be the more easily adapted to the sense of the others.

THIS is a very eligible cypher, as it free from suspicion, but it will do only for short messages: for if the spaces be frequent it will be very difficult to make the concealed and obvious meanings agree together; and if the sense be not clear, the writing will be liable to suspicion.

The Musical Cypher.

THE construction of this cypher, is similar to that of the mystical dial. The circle EFGH (Plate II.) is to be divided into twenty six equal parts, in each part there must be wrote one of the letters of the alphabet: and on the interior circle ILMN, moveable round the center O, there is to be the same number of divisions: the circumference of the inner circle must be ruled in the manner of music paper, and in each division there is to be placed a note, different either in figure or position. Lastly, within the musical lines place the three keys, and on the outer circle, the figures that are commonly used to denote the time.

THEN provide yourself with a ruled paper, and place one of the keys, as suppose that of *ge re sol*, against the time two-fourths at the beginning of the paper, which will inform your correspondent how to fix his circle. You then copy the notes that answer to the several letters of the words you intend to write, in the manner expressed at the bottom of the plate.

A CYPHER of this ſort may be made more difficult to diſcover by frequently changing the key, and that will not in the leaſt embarraſs the reader. You may likewiſe add the mark * or ♭ to the note that begins a word, which will make it more eaſy to read, and at the ſame time give the muſic a more natural aſpect. This cypher is preferable to that of the myſtical dial, as it may be encloſed in a letter about common affairs, and paſs unſuſpected: unleſs it ſhould fall into the hands of any one who underſtands compoſition, for he would very likely ſurmiſe, from the odd diſpoſition of the notes, "that more is meant than meets the ear."

A Perſon making choice of ſeveral Numbers, another ſhall name him the Number by which the Sum of thoſe Numbers is diviſible.

PROVIDE a ſmall bag, divided into two parts: in one part put ſeveral tickets, on each of which is wrote a number diviſible by three, as 6, 9, 15, 36, 63, 120, 213, 309, &c. and in the other part put tickets marked with the number 3 only. From the firſt part draw a handful of tickets, and after ſhewing them, put them in again; then open the bag, and deſire any one to take out as many tickets as he thinks proper; ſhut the bag, and when you open it again offer the other part to another perſon, telling him to take out one ticket only: you then pronounce that ticket to contain the number by which the amount of the other numbers is diviſible. For each of thoſe numbers being diviſible by 3, their ſum alſo, muſt be diviſible by the ſame number.

To find the Difference between two Numbers, the greateſt of which is unknown.

TAKE as many nines as there are figures in the ſmalleſt number, and ſubtract that ſum from the number of nines. Let another perſon add that difference to the largeſt number, and taking away the firſt figure of the amount, add it to the laſt figure, and that ſum will be the difference of the two numbers.

FOR example: Matthew, who is 22, tells Henry, who is older, that he can diſcover the difference of their ages; he therefore privately deducts 22 from 99, and the difference, which is 77, he tells Henry to add to his age, and to take away the firſt figure from the amount, and add it to the laſt figure,

figure, and that laſt ſum will be the difference of their ages, As thus:

The difference between Matthew's age and 99 is	77
To which Henry adding his age	35
The ſum is	112
	12
	1
Then by taking away the firſt figure 1 and adding it to the laſt figure 2, the ſum is	13
Which added to Matthew's age	22
Gives the age of Henry, which is	35

To tell, by the Dial of a Watch, at what Hour any Perſon intends to riſe.

Let the perſon ſet the hand of the dial to any hour he pleaſes, and tell you what hour that is, and to the number of that hour you add, in your mind, 12. Then tell him to count privately the number of that amount upon the dial, beginning with the next hour to that on which he propoſes to riſe, and counting backwards, firſt reckoning the number of the hour at which he has placed the hand. An example will make this plain.

SUPPOSE the hour at which he intends to riſe be 8, and that he has placed the hand at 5. You add 12 to 5, and tell him to count 17 on the dial, firſt reckoning 5, the hour at which the index ſtands, and counting backwards from the hour at which he intends to riſe, and the number 17 will neceſſarily end at 8, which ſhews that to be the hour he choſe.

THAT the hour at which the counting ends muſt be that on which he propoſed to riſe, will be evident on a little reflection; for if he had began at that hour and counted 12, he would neceſſarily have come to it again; and calling the number 17, by adding 5 to it, only ſerves to diſguiſe the matter, but can make no ſort of difference in the counting.

A Perſon chuſing any two, out of ſeveral given Numbers, and after adding them together, ſtriking out one of the Figures from the Amount, to tell you what that Figure was.

SUCH numbers muſt be offered as are diviſible by 9; and when any two of them are added together there muſt be no cypher in the amount: the figures of that amount, moreover, muſt make either 9 or 18. Such are the numbers following; 36, 63, 81, 117, 126, 162, 207, 226, 252, 261, 306 315 360, and 432.

THESE numbers muſt be wrote on cards; and when any two of them are added together, if a figure be ſtruck out of the ſum, it will be what would make the other figures either 9 or 18. For example; if a perſon choſe 126 and 252, their ſum will be 378, from which he ſtrikes out the 7, the remaining figures 3 and 8 will make 11, to which 7 muſt be added to make 18.

Two Perſons chuſing two Numbers, and multiplying them together, by knowing the laſt Figure of the Product to tell the other Figures.

IF the number 73 be multiplied by the numbers of the following arithmetical progreſſions, 3, 6, 9, 12, 15, 18, 21, 24, and 27, their products will terminate with the nine digits in this order, 9, 8, 7, 6, 5, 4, 3, 2, 1; the numbers being as follows, 219, 438, 657, 876, 1095, 1314, 1533, 1752, 1971; therefore put into one of the diviſions of the little bag, mentioned in a former Recreation, ſeveral tickets marked with the number 73, and in the other part of the bag the numbers 3, 6, 9, 12, 15, 18, 21, 24, and 27.

THEN open that part of the bag where are the numbers 73, and deſire a perſon to take out one ticket only, then dexterouſly change the opening, and deſire another perſon to take a ticket from that part, and when you have multiplied their two numbers together, by knowing the laſt figure of the product you will readily tell them by the foregoing ſeries, what the other figures are.

The

The Magical Century.

IF the number 11 be multiplied by any one of the nine digits, the two figures of the product will always be ſimilar. As follows:

11	11	11	11	11	11	11	11	11
1	2	3	4	5	6	7	8	9
—	—	—	—	—	—	—	—	—
11	22	33	44	55	66	77	88	99

PLACE a parcel of counters on a table, and propoſe to any one to add, alternately, a certain number of thoſe counters till they amount to a hundred, but never to add more than 10 at one time. You tell him, moreover, that if you ſtake firſt he ſhall never make the even century, but you will. In order to which you muſt firſt ſtake 1, and remembering the order of the above ſeries, 11, 22, 33, &c. you conſtantly add, to what he ſtakes, as many as will make one more than the numbers of that ſeries, that is, as will make 12, 23, 34, &c. till you come to 89, after which the other party cannot make the century himſelf, or prevent you from making it.

IF the other party has no knowledge of numbers, you may ſtake any number firſt, under 10, provided you take care to ſecure ſome one of the laſt terms, as 56, 67, 78, &c.

THIS Recreation may be performed with other numbers; and in order to ſucceed, you muſt divide the number to be attained, by a number that has one digit more than what you can ſtake each time, and the remainder will be the number you muſt firſt ſtake. Obſerve, that to be ſure of ſucceſs, there muſt be always a remainder. Suppoſe, for example, the number to be attained is 52, making uſe of a pack of cards inſtead of counters, and that you are never to add more than 6; then divide 52 by the next number above 6, that is, by 7, and the remainder, which is 3, will be the number you muſt ſtake firſt; and whatever the other ſtakes, you muſt add as much to it as will make it equal to the number by which you divided, that is, 7. Therefore if his firſt ſtake be 1, you muſt ſtake 6, &c. ſo that your ſecond ſtake will make the heap 10, your third ſtake will make it 17, and ſo on, till you come to 45, when as he cannot ſtake more than 6, you muſt make the number 52.

In this, as in the former caſe, if the other perſon has no knowledge of numbers, you may ſtake any number firſt under 7; or you may let him ſtake firſt, only taking care to ſecure either of the numbers 10, 17, 24, 31, &c. after which he cannot make 52, if you conſtantly add as many to his ſtake as will make it 7.

The Confederate Counters.

PRESENT to three perſons a ring, a ſeal, and a ſnuff-box, of which deſire each perſon to chuſe one privately. The three perſons you diſcriminate in your mind by the letters A, E, I, and by the ſame letters you diſtinguiſh the ring, the ſeal, and the box. Provide 24 counters, of which give the firſt perſon A, 1, the ſecond perſon E, 2, and the third Perſon I, 3. Put the 18 remaining counters on the table, and let him that has the ring take as many counters more as he already has; him that has the ſeal take twice as many as he has; and him that has the box four times as many. While they are taking the counters you retire out of ſight, and when they have done you return, and caſting your eye on the table, take notice how many counters are left.

The remaining counters will be either 1, 2, 3, 5, 6, or 7, which you are to refer to the vowels in the ſyllables of the following verſe:

1 2 3 5 6

Par fer—Ce ſar—ja dis—de vint—ſi grand

7

prince.

If there be but one counter left, the two vowels in the ſyllables *par fer* denote that the firſt perſon has the ring, to which you have aſſigned the letter A; the ſecond perſon has the ſeal, to which you have aſſigned the letter E; and conſequently the third perſon muſt have the box. In like manner, if there be ſix counters remaining, the two vowels in the ſyllables *ſi grand*, ſhew that the firſt perſon has the box, denoted by the letter I: the ſecond perſon has the ring, to which the letter A is aſſigned; and conſequently the third perſon has the ſeal: and ſo of the reſt. For the three articles can be taken only ſix different ways. Now each of theſe ways neceſſarily changes the number

number of counters to be taken by the three perſons; from whence it follows, that the counters remaining on the table will be of ſix different numbers; the vowels in the ſyllables of the verſe ſerve only to aid the memory in diſcovering the manner in which the three articles are taken.

Queſtion.

THERE are an hundred apples and one baſket, ranged in a ſtraight line at the diſtance of a pace one from another; the queſtion is, how many paces muſt he walk that pretends to gather the apples one after another, and ſo put them into the baſket, which is not to be removed from its place?

IT is certain, that for the firſt apple he muſt make 2 paces, one to go and another to return; for the ſecond 4, two to go and two to return: for the third 6, three to go, and ſo on in this arithmetical progreſſion, 2, 4, 6, 8, 10, &c. of which the laſt and greateſt term will be 200, that is, double the number of apples. To 200 the laſt term, add 2, the firſt term, and multiply the ſum 202 by 50, which is half the number of apples, or the number of the multitude of the terms; and the product, 10,100, will be the ſum of all the terms, to the number of paces demanded. And if 1 pace be called 1 yard, the diſtance of ſpace gone over is equal to 5 miles and 3 quarters, all to about 20 yards.

Several Dice being thrown, to find the Number of Points that ariſe from them, after ſome Operations.

SUPPOSE three dice thrown upon a table, which we ſhall call A, B, C; bid the perſon that threw them add together all the uppermoſt points, and likewiſe thoſe underneath of any two of the three: For inſtance, B and C, A being ſet apart, without altering its face. Then bid him throw again the ſame two dice, B and C, and make him add to the foregoing ſum all the points of the upper faces, and withal the lowermoſt points, or thoſe underneath of one of them, C for inſtance, B being ſet apart near A without changing its face, for giving a ſecond ſum. In fine, order him once more to throw the laſt dye C, and bid him add to the foregoing ſecond ſum the upper points, for a third ſum, which is thus to be diſcovered. After the third dye C is ſet by the other two, without changing its poſture, do you come up, and compute all the points upon the faces of the three dice, and add to their ſum as many 7's as there

there are dice, that is, in this example 21, and the ſum of theſe is what you look for; for when a dye is well made, 7 is the number of the points of the oppoſite faces.

To exemplify the matter; ſuppoſe the firſt throw of the three dice, A, B, C, brought up 1, 4, 5; ſetting apart the firſt 1, we add to theſe three points 1, 4, 5, the points 3 and 2 that are found under or oppoſite to the upper points 4 and 5, of the other two dice; and this gives me the firſt ſum 15. Now ſuppoſe again, that the two laſt dice are thrown, and ſhew uppermoſt the two points 3 and 6, we ſet that with the three points apart, near the dye that had 1 before, and add to the foregoing ſum (15) theſe two points 3 and 6, and withal 1, the point that is found lowermoſt in the dye that is ſtill kept in ſervice, and add 6 for its face at this throw; thus we have 25 for the ſecond ſum. We ſuppoſe at laſt, that this third and laſt dye being thrown a third time, it comes up 6, which we add to the ſecond ſum 25, and ſo make the third ſum 31. And this ſum is to be found out by adding 21 to 10, the ſum of the points 1, 3, 6, that appear upon the faces or uppermoſt ſides of the three dice then ſet by.

The Dice being thrown, to find the upper Points of each Dye without ſeeing them.

MAKE any one throw two dice upon a table, and add 5 to the double of the upper points of one of them, and add to the ſum multiplied by 5, the number of the uppermoſt points of the other, or the ſecond dye; after that, having aſked him the joint ſum, throw out of it 25, the ſquare of the number 5 that you gave to him, and the remainder will be a number conſiſting of two figures; the firſt of which to the left repreſenting the tens, is the number of the upper points of the firſt dye, and the ſecond figure to the right repreſenting units, is the number of the upper points of the ſecond dye.

We will ſuppoſe that the number of the points of the firſt dye that comes up is 2, and that of the ſecond 3; we add 5 to 4, the double of the points of the firſt, and multiply the ſum 9 by the ſame number 5, the product of which operation is 45, to which we add 3, the number of the upper points of the ſecond dye, and ſo make it 48; then we throw out of it 25, the ſquare of the ſame number 5*, and the remainder is 23, the firſt figure of which 2, repreſents the number of points of the

* The ſquare of a number is multiplying it by itſelf.

the first dye, and the second, 3, the number of points of the second dye.

Another way of answering this problem, is this: Ask him who threw the dice, what the points underneath make together, and how much the under points of one surpass those of the other; and if this excess is, for example, 1, and the sum of all the lower points is 9, add these two numbers 1 and 9, and subtract the sum 10 from 14; then take 2, the half of the remainder 4, for the number of the upper points of one of the dice; and as for the upper dye, instead of adding the excess 1 to the sum 9, subtract it out of 9, and take the remainder 8 out of 14, 6 is the remainder, the half of which, 3, is the number of the upper points of the second dye.

A third way is this: Bid the person who threw the dice add together the upper points, and tell you their sum, which we here suppose to be 5; then give him orders to multiply the number of the upper points of one dye by the number of upper points of the other dye, and to acquaint you in like manner with their product, which we here suppose to be 6: Now having this product 6, and the preceding sum 5, square 5, and from its square 25 subtract 24, the quadruple of the product 6, and the remainder is 1: Then take the square root of the remainder, which in this case is 1, and by adding it to and subtracting it from the foregoing sum 5, you have these two numbers, 6, 4, the halfs of which 3, 2, are the numbers of the upper points of each dye.

Upon the Throw of three Dice, to find the upper Points of each Dye, without seeing them.

ORDER the person that has thrown the dice, to place them near one another in a straight line, and ask him the sum of the lowermost points of the first and second dye, which we here suppose to be 9; then ask him the sum of the points underneath of the second and third, which we here suppose to be 5; and at last the under points of the first and third, which we put 6. Now, having these numbers given you, 9, 5, 6, subtract the second number 5 from 15, the sum of the first and third, 9 and 6; and the remainder 10 from 14; so there remains 4, the half of which, 2, is the number of the upper points of the first dye. To find the number of the upper points of the second, subtract the third number 6 from 14, the sum of the two first 9 and 5; and the remainder 8 from

from 14 again; ſo you have a ſecond remainder 6, the half of which, 3, is the number demanded. At laſt for the third dye, ſubtract the firſt number 3 from 11, the ſum of the ſecond and third, 5, 6, and the remainder 2 from 14; ſo you have a ſecond remainder 12, the half of which, 6, is the number of the upper points of the third dye.

To find a Number thought of by another.

ORDER the perſon to take 1 from the number thought upon, and after doubling the remainder, to take 1 from it, and add to the laſt remainder, the number thought upon. Then aſk him what the ſum is, and after adding 3 to it, take the third part of it for the number thought of. For example, Let 5 be the number, take 1 from it, there remains 4; then take 1 from 8, the double of that 4, and the remainder is 7, which becomes 12, by the addition of 5, the number thought of; and that 12, by the addition of 3, makes 15, the third part of which, 5, is the number thought of.

ANOTHER way is this: After taking 1 from the number thought of, let the remainder be tripled; then let him take 1 from that triple, and add to the remainder the number thought of. At laſt, aſk him the number ariſing from that addition, and if you add 4 to it, you will find the fourth part of the ſum to be the number thought of. Thus 5, baiting 1, makes 4, that tripled makes 12, which loſing 1, ſinks to 11, and enlarged by the acceſſion of 5, comes to 16, which by the addition of 4 is 20, and the fourth part of that, *viz.* 5, is the number thought of.

A curious and agreeable Wager, which you are ſure of winning.

ADDRESS ſome perſon in the company, and ſay, Madam, or, Sir, have you a watch, a ring, an etwee, or any other trinket? Begin by examining what has been given you, in order to form an idea of its value, ſince you are to lay your bet conſiderably under the intrinſic value of the trinket, to avoid being duped.

SUPPOSE what has been offered to you is a watch, you are to propoſe a guinea as a wager againſt it: ſaying to the lady or gentleman, I lay a guinea that you do not ſay three times, my watch: when it is put on the table, and your wager is accepted, aſk the perſon, preſenting him his watch, what is that; he will not fail to anſwer, it is my watch.

PRESENT

PRESENT him afterwards another object, making him the ſame queſtion: ſuppoſe the object you preſent to be a pen, a piece of paper, or any other thing. If the perſon names the object you preſent, he has loſt; if on the contrary, he is on his guard, and anſwers, my watch, he muſt certainly win; but if I loſe, what will you give me? the perſon, being always on his guard, will anſwer again, my watch: then, appealing to his own words, you will take the watch and leave him the ſtake.

Method of Melting Steel, and to ſee it liquify.

MELT a piece of ſteel quite in the fire; then holding it with a pair of pinchers or tongs, take in the other hand a ſtick of brimſtone, and touch the piece of ſteel with it; immediately after the contact, you will ſee the ſteel melt and drop like a liquid.

To pull off any Perſon's Shirt, without undreſſing him, or having occaſion for a Confederate.

THE means of performing this trick are the following: only obſerving that the cloaths of the perſon whoſe ſhirt is to be pulled off be wide and eaſy.

BEGIN by making him pull off his ſtock and unbuttoning his ſhirt at the neck and ſleeves, afterwards tye a little ſtring in the button-hole of the left ſleeve; then, paſſing your hand behind his back, pull the ſhirt out of his breeches, and ſlide it over his head; then pulling it out before in the ſame manner, you will leave it on his ſtomach: after that, go to the right hand, and pull the ſleeve down, ſo as to have it all out of the arm; the ſhirt being then all of a heap, as well in the right ſleeve as before the ſtomach, you are to make uſe of the little ſtring faſtened to the button-hole of the left ſleeve, to get back the ſleeve that muſt have ſlipt up, and to pull the whole ſhirt out that way.

To hide your way of operating from the perſon whom you unſhirt, and from the aſſembly, you may cover his head with a lady's cloak, holding a corner of it in your teeth.

IN order to be more at your eaſe, you may mount on a chair and do the whole operation under the cloak.

How

How to diſpoſe two little Figures, ſo that one ſhall light a Candle, and the other put it out.

TAKE two little figures of wood or clay, or any other materials you pleaſe, only taking care that there is a little hole at the mouth of each.—Put in the mouth of one a few grains of bruiſed gunpowder, and a little bit of phoſphorus in the mouth of the other; taking care that theſe preparations are made beforehand.

THEN take a lighted wax candle and preſent it to the mouth of the figure with the gunpowder, which taking fire will put the candle out. Then preſent your candle, having the ſnuff ſtill hot, to the other figure; it will immediately light again by means of the phoſphorus.

YOU may propoſe the ſame effects to be produced by two figures drawn on a wall with a pencil or coal, by applying with a little ſtarch or water, a few grains of bruiſed gunpowder to the mouth of one, and a bit of phoſphorus to the mouth of the other.

Optical Illuſions.

ON the bottom of the veſſel A B C D, (Plate III. Fig. 1.) place three pieces of money, as a ſhilling, a half-crown, and crown; the firſt at E, the ſecond at F, and the laſt at G. Then place a perſon at H, where he can ſee no farther into the veſſel than I; and tell him that by pouring water into the veſſel you will make him ſee three different pieces of money; bidding him obſerve carefully, whether any money goes in with the water.

YOU muſt either pour it in very gently, or contrive to fix the pieces, that they may not move out of the places by the motion of the water.

WHEN the water comes up to K, the piece at E will become viſible; when it comes up to L, the pieces at E and F will appear; and when it riſes to M, all the three pieces will be viſible.

FROM what has been ſaid of the refraction of light*, the cauſe of this phenomenon will be evident; for while the veſſel is empty, the ray H I will naturally proceed in a ſtraight line; but in proportion as it becomes immerſed in water, it will be neceſſarily

* See Appendix.

neceſſarily refracted into the ſeveral directions NE, OF, PG, and conſequently the ſeveral pieces muſt become viſible.

Optical Augmentation.

TAKE a large drinking glaſs of a conical figure, that is ſmall at bottom and wide at top; in which put a ſhilling, and fill the glaſs about half full of water: then place a plate on the top of it, and turn it quickly over, that the water may not get out. You will then ſee on the plate a piece of the ſize of a half crown; and ſomewhat higher up, another piece of the ſize of a ſhilling.

THIS phenomenon ariſes from ſeeing the piece through the conical ſurface of the water at the ſide of the glaſs, and through the flat ſurface at the top of the water at the ſame time: for the conical ſurface dilates the rays, and makes the piece appear larger; but by the flat ſurface the rays are only refracted, by which the piece is ſeen higher up in the glaſs, but ſtill of its natural ſize. That this is the cauſe will be further evident by filling the glaſs with water, for as the ſhilling cannot be then ſeen from the top, the large piece only will be viſible.

AFTER you have amuſed yourſelf with this remarkable phenomenon, you may give the glaſs to a ſervant, telling him to throw out the water, and take care of the two pieces of money; and if he has no ſuſpicion of the deception, he will be not a little ſurpriſed to find one piece only.

Optical Subtraction.

AGAINST the wainſcot of a room fix three ſmall pieces of paper, as A, B, C, (Plate III. Fig. 2.) at the height of your eye, and placing yourſelf directly before them, at a few yards diſtance, ſhut your right eye, and look at them with the left; when you will ſee only two of thoſe papers, ſuppoſe A and B; but altering the poſition of your eye you will then ſee the third and one of the firſt, ſuppoſe A; and by altering your poſition a ſecond time, you will ſee B and C; but never all three of them together.

THE cauſe of this phenomenon is, that one of the three pencils of rays that come from theſe objects, falls on the optic nerve at D; whereas to produce diſtinct viſion it is neceſſary that the rays of light fall on ſome part of the retina E, F, G, H. We ſee by this experiment, one of the uſes of having two eyes; for he that has one only, can never ſee three objects

placed in this position, nor all the parts of one object of the same extent, without altering the situation of his eye.

The Camera Obscura, or dark Chamber.

WE shall here give a short description of this optical invention: for though it is very common, it is also very pleasing; and though almost every one has seen it, every one knows not how to construct it.

MAKE a circular hole in the shutter of a window, from whence there is a prospect of the fields, or any other object not too near; and in this hole place a convex glass, either double or single, whose focus is at the distance of five or six feet. The distance should not be less than three feet; for if it be, the images will be too small, and there will not be sufficient room for the spectators to stand conveniently. On the other hand the focus should never be more than 15 or 20 feet, for then the images will be obscure, and the colouring faint. The best distance is from six to twelve feet. Take care that no light enters the room but by this glass; at a distance from it, equal to that of its focus, place a pasteboard, covered with the whitest paper; this paper should have a black border, to prevent any of the side rays from disturbing the picture; let it be two feet and a half long, and eighteen or twenty inches high: bend the length of it inwards, to the form of part of a circle, whose diameter is equal to double the focal distance of the glass. Then fix it on a frame of the same figure, and put it on a moveable foot, that it may be easily fixed at that exact distance from the glass where the objects paint themselves to the greatest perfection. When it is thus placed, all the objects that are in the front of the window will be painted on the paper, in an inverted position, this inverted position of the images may be deemed an imperfection, but it is easily remedied: for if you stand above the board on which they are received, and look down on it, they will appear in their natural position: or if you stand before it, and placing a common mirror against your breast in an oblique direction, look down in it you will there see the images erect, and they will receive an additional lustre from the reflection of the glass; or place two lenses, in a tube that draws out; or, lastly, if you place a large concave mirror at a proper distance before the picture, it will appear before the mirror, in the air, and in an erect

position

poſition, with the greateſt regularity and in the moſt natural colours.

If you place a moveable mirror without the window, by turning it more or leſs, you will have on the paper all the objects that are on each ſide of the window.

There is another method of making the dark chamber, which is by a ſcioptric ball, that is a ball of wood, through which a hole is made, in which hole a lens is fixed: this ball is placed in a wooden frame, in which it turns freely round. The frame is fixed to the hole in the ſhutter, and the ball by turning about, anſwers, in great part, the uſe of the mirror on the outſide of the window. If the hole in the window be no bigger than a pea, the objects will be repreſented without any lens.

If inſtead of placing the mirror without the window you place it in the room, and above the hole (which muſt then be made near the top of the ſhutter,) you may receive the repreſentation on a paper placed horizontally on a table; and draw at your leiſure, all the objects that are there painted.

Nothing can be more pleaſing than this Recreation, eſpecially when the objects are ſtrongly enlightened by the ſun: and not only land proſpects, but a ſea-port, when the water is ſomewhat agitated, or at the ſetting of the ſun, preſents a very delightful appearance.

This repreſentation affords the moſt perfect model for painters, as well for the tone of colours, as that degradation of ſhades, occaſioned by the interpoſition of the air, which has been ſo juſtly expreſſed by ſome modern painters.

It is neceſſary that the paper have a circular form, for otherwiſe, when the center of it was in the focus of the glaſs, the two ſides would be beyond it, and conſequently the images would be confuſed. If the frame were contrived of a ſpherical figure, and the glaſs were in its center, the repreſentation would be ſtill more accurate. If the object without be at the diſtance of twice the focal length of the glaſs, the image in the room will be of the ſame magnitude with the object.

The lights, ſhades, and colours in the camera obſcura appear not only juſt, but, by the images being reduced to a ſmaller compaſs, much ſtronger than in nature; add to this, that theſe pictures exceed all others by repreſenting the motion of the ſeveral objects: thus we ſee the animals walk, run, or

fly, the clouds float in the air, the leaves quiver, the waves roll, &c. and all in ſtrict conformity to the laws of nature. The beſt ſituation for a dark chamber is directly north, and the beſt time of the day is noon.

To ſhew the Spots on the Sun's diſk, by its Image in the Camera Obſcura.

PUT the object-glaſs of a ten or twelve foot teleſcope into the ſcioptric ball and turn it about till it be directly oppoſite the ſun. When the ſun is directly oppoſite the hole the lens will itſelf be ſufficient: or by means of the mirror on the outſide of the window, as in the laſt Recreation, the lens will anſwer the purpoſe at any time. Then place the paſteboard, mentioned in the laſt Recreation, in the focus of the lens, and you will ſee a clear bright image of the ſun, of about an inch diameter, in which the ſpots on the ſun's ſurface will be exactly deſcribed.

As this image is too bright to be ſeen with pleaſure by the naked eye, you may view it through a lens, whoſe focus is 6 or 8 inches diſtant, which at the ſame time that it prevents the light from being offenſive, will by magnifying both the image and the ſpots, make them appear to greater advantage.

To magnify ſmall Objects by means of the Sun's Rays let into a dark Chamber.

LET the rays of light that paſs through the lens in the ſhutter be thrown on a large concave mirror, properly fixed in a frame. Then take a ſlip, or thin plate of glaſs, and ſticking any ſmall object on it, hold it in the incident rays, at a little more than the focal diſtance from the mirror, and you will ſee, on the oppoſite wall, amidſt the reflected rays, the image of that object, very large, and extremely clear and bright. This experiment never fails to give the ſpectator the higheſt ſatisfaction.

The Magic Lantern.

THIS very remarkable machine, which is now known over all the world, cauſed great aſtoniſhment at its origin. It is ſtill beheld with pleaſing admiration, and the ſpectator very frequently contents himſelf with wondering at its effects, without endeavouring to inveſtigate their cauſe. The invention of this ingenious illuſion is attributed to the celebrated

P.

F. Kircher, who has publiſhed, on various ſciences, works equally learned, curious, and entertaining.

THE deſign of this machine is to repreſent at large, on a cloth or board, placed in the dark, the images of ſmall objects, painted with tranſparent colours on plates of glaſs.

ITS conſtruction is as follows. Let ABCD (Pl. III. Fig. 3) be a tin box, eight inches high, ten long, and ſix wide (or any other ſimilar dimenſions.) At the top muſt be a funnel E, of four inches in diameter, with a cover F, which, at the ſame time that it gives a paſſage to the ſmoke, prevents the light from coming out of the box.

ON the ſide AC there is a door, by which is adjuſted a concave mirror G, of metal or tin, and of five inches diameter, being part of a ſphere whoſe diameter is eighteen inches, this mirror muſt be ſo diſpoſed that it may be puſhed forward or drawn back by means of the handle H, that enters the tin tube I, which is ſoldered to the door.

IN the middle of the box muſt be placed a low tin lamp K, which is to be moveable. It ſhould have three or four lights, that muſt be at the height of the focus of the mirror G.

IN the ſide BD, and oppoſite to the mirror, there muſt be an aperture of three inches wide and two inches and a half high, in which is to be fixed a convex glaſs L, of the ſame dimenſion. I prefer this form for the glaſs (ſays M. Guyot) that the picture thrown upon the cloth may have the ſame form, which is much preferable to a circular aperture, through which the figures can never be completely ſeen but when they are at the center of the glaſs. It is ſurpriſing that this imperfection has been ſuffered to continue ſo long, when it is ſo eaſily remedied. The focus muſt be from four inches and a half to five inches, ſo that the lamp may be placed both in its focus, and in that of the concave mirror.

ON the ſame ſide place a piece of tin MN, of four inches and a half ſquare, having an opening at the ſides of about four inches and a half high, and a quarter of an inch wide. Through this opening or groove are to paſs the glaſſes, on which are painted the figures that are to be ſeen on the cloth. In this tin piece, and oppoſite the glaſs L, let there be an aperture of three inches and a quarter long, and two inches and a quarter high, to which muſt be adjuſted a tube O, of the ſame form, and ſix inches long. This tube is to be fixed into the piece MN. Another tube, ſix inches long, and

moveable, muſt enter that juſt mentioned, in which muſt be placed two convex lenſes, P and Q: that of P may have a focus of about three inches, and that of Q, which is to be placed at the extremity of the tube, one of ten or twelve inches. The diſtance between theſe glaſſes is to be regulated by their foci. Between theſe glaſſes there muſt be placed a paſteboard R, in which is an aperture of an inch wide, and 4-5ths of an inch high. By placing this tube farther in or out of the other, the images on the cloth will appear larger or ſmaller.

From what has been ſaid of the preceding machines, the conſtruction of this will be eaſily underſtood. The foci of the concave mirror, and the lens L, meeting in the flame of the lamp, they together throw a ſtrong light on the figures painted on the glaſſes that paſs through the groove MN, and by that means render their colours diſtinct on the cloth. The rays from thoſe glaſſes paſſing through the lens P are collected by the aperture in the paſteboard R, and conveyed to the lens Q, by which they are thrown on the cloth.

The lantern being thus adjuſted, you muſt provide plates of clear glaſs, of twelve or fifteen inches long, and three inches wide, which are to be placed in thin frames, that they may paſs freely through the groove MN, after being painted in the manner we ſhall now deſcribe.

Method of Painting the Glaſſes for the Lantern.

Draw on a paper the ſubject you intend to paint, and fix it at each end to the glaſs. Provide a varniſh with which you have mixed ſome black paint, and with a fine pencil draw on the other ſide of the glaſs, with very light touches, the deſign drawn on the paper. If you are deſirous of making the painting as perfect as poſſible, you ſhould draw ſome of the outlines in their proper colours, provided they are the ſtrongeſt tints of thoſe colours that are uſed. When the outlines are dry you colour the figures with their proper tints or degradations; and thoſe colours will not peel off, if you temper them with a ſtrong white varniſh. All thoſe colours that are not terreſtrial, as pruſſian blue, carmine, calcined verdigris, &c. may be uſed to advantage, when tempered with a proper varniſh. You are then to ſhade them with black mixed with the ſame varniſh, or white biſtre, as you find convenient. You may alſo leave ſtrong lights in ſome parts, without any colours,

in

in order to produce a more ſtriking effect. Obſerve, in particular, not to uſe more than four or five colours, ſuch as blue, red, green, and yellow. You ſhould employ however a great variety of tints, to give your painting a more natural air, without which they will repreſent vulgar objects, which are by no means the more pleaſing becauſe they are gaudy.

When the lamp in this lantern is lighted, and by drawing out the tube to a proper length, the figures painted on the glaſs appear bright and well defined, the ſpectator cannot fail of being highly entertained by the ſucceſſion of natural or groteſque figures that are painted on the glaſſes.

This piece of optics may be rendered much more amuſing, and at the ſame time more marvellous, by preparing figures to which different natural motions may be given. There are in the Philoſophical Eſſays of M. Muſchenbroek, different methods of performing all theſe various movements, by ſome mechanical contrivances that are not difficult to execute, which every one may perform according to his own taſte: either by movements in the figures themſelves, or by painting the ſubject on two glaſſes, and paſſing them at the ſame time through the groove.

How to rub out Twenty Chalks at five Times rubbing out, every Time an odd one.

TRICKS of this kind are more generally the diverſion of low mechanics, who, having ſtudied what is trifling, more than what is uſeful, fancy themſelves conjurers, and not a little proud, often affront and inſult thoſe of ſuperior knowledge; always ready to lay wagers, when in their cups, offer five to one, ten to one, or any odds that come uppermoſt, that none can do the like but themſelves; yet ſometimes theſe cunning men find themſelves at a loſs, when they meet with a perſon who is equally knowing, who makes their pockets pay for their boaſting. From theſe ſort of wagers ariſe quarrels; for if one is not equal to another in point of calculation, he thinks he may be in point of manhood; a challenge is given and accepted; and the combatants, fierce as bull-dogs, begin throwing their athletic arms at each other, the ſtones are rammed deeper with their falls, the noiſy attendants make confuſion aſhamed with their vociferous clamouring. "Well ſtruck, Dick, that was a nice one, Tom, at him again, under his ribs, darken his day-lights, mindyour points, find out his bread baſket,

tip

tip him Slack's favourite, give him a croſs-buttock, and come Ben Boſle over his jaw-bone. Huzza! huzza! huzza!" Then the valiant heroes, encouraged by their friends, the rabble, bruiſe one another's fleſh; and at laſt, the victor, perhaps, gains for his triumph, a black eye, bloody noſe, and diſlocated jaw, and all his comfort is, that his antagoniſt has the ſame ſort of honour doubled. After all this, a few tankards of porter make friends; but their wives and families are the greateſt ſufferers, who are at home pining in rags and want, while their huſbands are loſing their time, and abuſing themſelves.

THE following trick is one of thoſe moſt in practice amongſt them:

To do this trick you muſt make twenty chalks or long ſtrokes upon a board, as in the margin.

THEN begin and count backwards, as 20, 19, 18, 17, rub out theſe four, then proceed ſaying, 16, 15, 14, 13, rub out theſe four, and begin again, 12, 11, 10, 9, and rub out theſe, and proceed again, 8, 7, 6, 5, then rub out theſe, and laſtly ſay, 4, 3, 2, 1; when theſe four are rubbed out, the whole twenty are rubbed out at five times, and every time an odd one, that is, the 17th, 13th, 9th, 5th, and 1ſt.

1—
2—
3—
4—
5—
6—
7—
8—
9—
10—
11—
12—
13—
14—
15—
16—
17—
18—
19—
20—

THIS is a trick, which, if once ſeen, may be eaſily retained; and the only puzzle at firſt is, it not occurring immediately to the mind, to begin to rub them out backwards. It is as ſimple as any thing poſſibly can be, and might do very well when people are ſocial and good-humoured together; but when they are fluſhed with liquor, and fractious by nature, I adviſe all thoſe who love peace and quietneſs, not to be curious to know what they cannot directly comprehend, as one word brings on another, and the conſequences may be what is diſplayed in the preface to this trick.

To cut a Looking-glaſs, or Piece of Chryſtal, let it be ever ſo thick, without the help of a Diamond, in the ſame ſhape as the Mark of the Drawing made on it with Ink.

THIS remarkable operation unites utility with amuſement. For being in the country, or in a place where there is no glazier

zier nor glaſsman to be had, the following means will anſwer the purpoſe without their help.

TAKE a bit of a walnut-tree, about the thickneſs of a candle, and cut one of its ends to a point; put that end in the fire, and let it burn till it is quite red. While the ſtick is burning, draw on the glaſs or chryſtal, with ink, the deſign or outline of the form in which you mean to cut it out. Then take a file, or bit of glaſs, and ſcratch a little the place where you mean to begin your ſection: then take the wood red hot from the fire, and lay the point of it about the twentieth part of an inch, or thickneſs of a guinea, from the marked place, taking care to blow always on that point, in order to keep it red; following the drawing traced on the glaſs, leaving, as before, about the twentieth part of an inch interval every time that you preſent your piece of wood, which you muſt take care to blow often.

AFTER having followed exactly the outlines of your drawing, to ſeparate the two pieces thus cut, you need only pull them up and down, and they will divide.

To change the colour of a Roſe.

NOTHING more is wanting to change the colour of a roſe, whether it is on its ſtalk or not, than to burn ſome ſulphur under it; which will make it turn white, and it will not regain its primitive colour in leſs than two hours.

Blind Abbeſs and her Nuns.

A BLIND abbeſs viſiting her nuns, who were equally diſtributed in eight cells built at the four corners of a ſquare, and in the middle of each ſide; finds an equal number of perſons in each row or ſide containing three cells. At a ſecond viſit ſhe finds the ſame number of perſons in each row, though their number was enlarged by the acceſſion of four men: And coming a third time, ſhe ſtill finds the ſame number of perſons in each row, though the four men were then gone, and had carried each of them a nun with them.

To reſolve the firſt caſe, when the four men were got into the cells, we muſt conceive it ſo, that there was a man in each corner cell, and that two nuns removed from thence to each

of

3	3	3
3		3
3	3	3

of the middle cells: At this rate, each corner cell contained one perſon leſs than before; and each middle cell two more than before. Suppoſe then, that at the firſt viſitation, each cell contained 3 nuns; and ſo, that there were nine in each row, and twenty-four in all; at the ſecond viſit, which is the firſt caſe in queſtion, there muſt have been five nuns in each middle cell, and two perſons, *viz.* a man and a nun in each corner cell: which ſtill makes nine perſon in each row.

2	5	2
5		5
2	5	2

To account for the ſecond caſe, when the four men were gone, and four nuns with them, each corner cell muſt have contained one nun more than at the firſt viſit, and each middle cell two fewer: And thus, according to the ſuppoſition laid down, each corner cell contained four nuns, and there was only one in each middle cell, which ſtill make nine in a row, though the the whole number was but twenty.

4	1	4
1		1
4	1	4

To find the Number remaining after ſome Operations, without aſking any Queſtions.

BID a perſon add what number you will to the number thought of, and multiply the ſum by the number thought of; for if you make him ſubtract the ſquare of the number thought of from the product, and tell you the remainder, you have nothing to do but to divide the remainder by the number you gave him to add before; for the quotient is the number thought of. Thus 4 added to the 5, (the number thought of) makes 9, which being multiplied by 5, makes 45; from which take 25, the ſquare of the number thought of, and there remains 20, which being divided by 4, you have 5 in the quotient.

Or elſe, bid the perſon that thinks take a certain leſſer number from the number thought of, and multiply the remainder by the ſame number thought of; for if you make him take the ſquare of the number thought of from the product, and tell the remainder, by dividing the remainder by the number you ordered

ordered to be taken from the number thought of, you have the number thought of in the quotient.

But of all the ways of finding out a number thought of, the following is certainly the eaſieſt; make him take from the number thought of what number you pitch upon that is leſs than it, and ſet the remainder apart; then make him add the ſame number to the number thought upon, and the preceding remainder to the ſum, for a ſecond ſum; which he is to diſcover to you, and the half of that ſum is the number thought of. Thus 5 being thought of, and 3 taken from it, the remainder is 2; and the ſame number 3 added to 5 makes 8, and that, with the preceding remainder, 10, the half of which, 5, is the number thought of.

To find the Number thought of by another, without aſking any Queſtions.

BID the other perſon add to the number thought of its half if it be even, or its greateſt half if it be odd; and to that ſum its half or greateſt half, according as it is even or odd, for the ſecond ſum, from which bid him ſubtract the double of the number thought of, and take the half of the remainder, or its leaſt half, if the remainder be odd; and thus he is to continue to take half after half, till he comes to an Unit. In the mean time you are to obſerve how many ſubdiviſions he makes, retaining in your mind for the firſt diviſion 2, for the ſecond 4, for the third 8, and ſo on in a double proportion remembering ſtill to add 1 every time he took the leaſt half; and that when he can make no ſubdiviſion, you are to retain only 1. By this means you have the number that he has halved ſo often, and the quadruple of that number is the number thought of, if ſo be he was not obliged to take the greateſt half at the beginning, which can only happen when the number thought of is evenly even, or diviſible by 4: in othes caſes, if the greateſt half was taken at the firſt diviſion, you muſt ſubtract 3 from that quadruple; if the greateſt half was taken only at the ſecond diviſion, you ſubtract but 2: and if he took the greateſt half at each of the two diviſions, you are to ſubtract 5 from the quadruple, and the remainder is the number thought of.

For example, let 4, be the number thonght of, which by the addition of its half, 2, becomes 6, and that by the addition of its half 3, is 9; from which, 8, the double of the number thought

thought of, being ſubtracted, the remainder is 1, that admits of no diviſion; and for this reaſon you retain only 1 in your mind, the quadruple of which, 4, is the number thought of.

AGAIN; let 7 be the number thought of; this being odd, the greateſt half of it, 4, added to it makes 11, which is odd again; and ſo to the greateſt half of 11 added to 11, makes 17, from which we take 14, the double of the number thought of, and ſo the remainder is 3, the leaſt half of which is 1, that admits of no further diviſion. Here there being but one ſub-diviſion, we retain 2, and to that add 1 for the leaſt half taken, ſo we have 3, the quadruple of which is 12. But becauſe the greateſt moiety was taken both in the firſt and ſecond diviſion, we muſt ſubtract 5 from 12, and the remainder 7 is the number thought of.

To find out Two Numbers thought of by any one.

BID a perſon multiply the two numbers 5, 3, together; and then multiply the ſum of two numbers 8 by the number you want to find, whether the greater or leſſer, and ſubtract the product of the two numbers 15 from that product (which is 40, if you want the greater, and 24, if you look for the leſſer number) and tell you the remainder, 25, or 9, the ſquare roots of which ſatisfies the demand.

WHEN the leaſt of the two numbers does not exceed 9, it is eaſier to find them out after this manner: Let 1 be added to the triple of the greateſt (of the two numbers thought of, the triple of that ſum, and the total ſum diſcovered; from which you are to take off 3, and then the right-hand figure is the leaſt, and the left-hand figure the greateſt number thought of. Thus 3 times 5, more, 1, and the triple of that 48 added to 8, the ſum of the two numbers, makes 56, which loſing 3, is 53; 3 the right-hand figure being the leaſt, and 5 on the left the greateſt number thought of. Or to 9 times the greateſt number add the ſum of them both, then is the left-hand figure the greateſt and the right-hand one the leaſt; thus 9 times 5 is 45, to which add 8, the ſum is 53.

Strange Tricks performed by Electricity.

AMONG the wonderful diſcoveries of human nature, there is hardly any that rank higher than electricity.

THIS

THIS Phenomenon, like many others, was found out merely by accident; yet it has proved not only a ſource for various experiments, but likewiſe extremely beneficial to mankind.

THE great Dr. Franklin has improved more in this branch of knowledge than any other perſon; he even contrived to bring lightning from the clouds by means of conductors; theſe conductors are of great ſervice, when fixed to churches, and other public edifices, to preſerve them from the dreadful effects of the rapidneſs of elemental fire.

WHEN electricity is made uſe of phyſically, it is of great utility, and has been known to relieve, and ſometimes entirely cure, various diſorders; it is very ſerviceable in the rheumatiſm, and other chronic diſorders.

ONE circumſtance I ſhall mention, which I received* from a gentleman who has been dead ſome years, but whoſe character as an artiſt, and an ingenious perſon, will be a long time remembered; I mean Mr. Benjamin Rackſtrow, of Fleet-ſtreet.

HE told me, that having ſome company one day to ſee his muſeum, and his electrical experiments, they were rather fearful of undergoing the ſhock; when a perſon who was much given to inebriety, being in the room, and rather intoxicated, voluntarily offered to let the experiment be tried on him. This was agreed to, upon which he received it pretty ſmartly three or four times, and thought no more about it at that time. A few days afterwards he had occaſion to go to Chicheſter, in Suſſex, and being rather low in circumſtances, was obliged to walk.

THIS man had been affected for many years with a rupture, which was extremely troubleſome, but on his journey he had not the leaſt ſymptom of it; on which he wrote a letter to Mr. Rackſtrow, informing him of this agreeable circumſtance, and imputing it entirely to his receiving the ſhock from his electrical apparatus. The man lived to confirm this by word of mouth; and what is really extraordinary, the rupture never returned, which is ſufficient to eſtabliſh its phyſical conſequence. It is of farther ſervice in palſies and contractions, and is performed by ſparks, drawn by friction, from the electrical machine.

ITS real uſe being thus eſtabliſhed, we may now, without offending, be a little merry with other circumſtances, which have, and may happen again, by means of electricity.

* The perſon from whom it is taken.

Some ladies and gentlemen coming to Mr. Rackſtrow's, brought with them a *negro* ſervant, who had not been long in England. After they had ſeen his natural and artificial curioſities, they deſired to ſee ſome of his electrical experiments, and gave him a hint to play a trick or two upon poor mungo. Mungo was not a little ſurpriſed at the ſhocks he received, but could not gueſs from whence they came; but when the room was darkened, and fire made to come out of his finger ends, he roared out like a mad bull, crying, the devil! the devil! and in endeavouring to get out of the room, overſet the ſkeleton of a Rhinoceros, run his head againſt a caſe full of butterflies, and broke to pieces a fine buſt of the Marquis of Granby; and having once more gained day light, made a ſudden ſpring into the ſtreet, and run immediately home, to the no ſmall diverſion of his maſter and family.

Mrs. Bulky being troubled with a tympany, was recommended to be electrified. She accordingly went to a profeſſor in that way, who aſked her if ſhe could bear a pretty hard ſhock? O, yes, Sir, ſaid ſhe, as hard as you pleaſe, and as often as you pleaſe, I am very fond of being *ſhocked*. The man by this, ſuppoſed ſhe had before undergone the operation, and was not ſparing to give her, what ſhe ſeemed ſo well to underſtand. But, alas! he wound up his inſtrument too high; ſo that he not only overſet his patient, but actually conveyed her into a cellar where they ſold ox-cheek and peas-ſoup: down went the ſteaming pan full of ſavory broth, and off flew her monument of a cap into the other boiling cauldron.

The cook reddened like a heated poker, the cuſtomers roſe from their ſeats, and confuſion took place in this ſubterraneous abode.

All culinary buſineſs was at an end for the preſent: the electrical doctor came running to the aſſiſtance of his patient; but as ſoon as the cauſe of the diſaſter was explained, the occupier of the place declared the damages ſhould be made good; her pan of leg of beef was entirely loſt, her peas ſoup ſpoiled by the powder and pomatum of the lady's head dreſs, the doctor was the cauſe of all, and he ſhould pay for all: but he declared, he would, ſooner than pay a farthing, electrify the houſe till it fell about their ears.

At laſt the lady, however, having adjuſted herſelf in the beſt manner ſhe could, gave the good woman a crown, and ſo compromiſed

compromised the matter; however, it cured her of her tympany, for she never went to the doctor afterwards.

Many are the tricks played by means of an electrifying machine. A person in the city had one in his shop which was not seen by the passers by; he hung at the door an old steelyard, which, from its make, seemed to be very ancient; this attracted the attention and notice of many, who no sooner went to examine it, than they received the shock. Those that knew what it was only smiled, and went on; others stared, and could not guess from whence it came.

A Dunnow porter being called one day, and asked what he would have to carry the steelyard to a certain place, went to examine it, but he no sooner touched it than he felt a blow, and turning roundy with an oath, declared, if he knew who it was, he would pay them well for their impudence. He then returned to speak about his job, and received another shock, and another after that, till, irritated by the supposed assaults, given by he could not tell who, he stripped in buff, to fight all that came in his way, till he got a mob of boys and dogs at his heels, and was glad to get away at any rate.

Such tricks are not recommended as proper to be practised, for they are really dangerous; a strange person might, on finding the truth, break the windows, or keep it in his mind, and do the electrifying gentleman some injury, which might make him repent of his experiments.

Small electrical machines are often introduced in company, and create not only mirth, but produce real rational amusement; such can never be disagreeable, but must give satisfaction to all who have any idea of philosophical knowledge, and wish to improve their minds by mathematical experiments: to all such we may safely recommend the electrical apparatus, which will be both useful and profitable.

Magnetism.

DEFINITIONS.

1. MAGNETISM is the science that explains the several properties of the attractive and repellant powers in the magnet or loadstone.

2. The magnet is a rich, heavy, iron ore, of a hard substance, a dusky grey colour, with some mixture of a reddish brown, and sparkling when broke.

3. THE magnetic virtue is called the third ſpecies of attraction; gravity being the firſt; and electricity the ſecond.

4. THE two ends of a magnet when it is properly formed, are called its poles; and when it is placed on a pivot, in juſt equilibrium, one end will turn towards the north, and is called its north pole, and the other end the ſouth pole. The poles of a magnet are found by holding a very fine ſhort needle over it; for where the poles are, the needle will ſtand upright, but no where elſe. The exterior parts are then to be filed or ground off, and the two extremities which contain the poles, to be made quite ſmooth.

5. WHEN the two poles of a magnet are ſurrounded with plates of ſteel, it is ſaid to be armed.

6. IF the end of a ſmall iron bar be rubbed againſt one of the poles of a magnet, it is ſaid to be touched, and is then called an artificial magnet.

7. IF ſuch a magnet be ſupported on a pivot, it is called a magnetic needle; one end of it turning towards the north, and the other towards the ſouth.

8. THE difference between the poſition of the needle, and the exact points of north and ſouth, is called its declination.

9. A needle which is touched will incline towards the earth, and that is called its inclination, or dipping.

APHORISMS.

1. THE magnetic attraction is produced by effluvia emitted by the magnet, and paſſing from one pole to the other. The direction of the magnetic effluvia is ſhewn by the following experiment. Let A B, C D, (Plate IV. Fig. 1.) be the poles of a magnet. Round every ſide lightly ſtrew ſteel filings on a ſheet of white paper; the particles of the filings will be ſo affected by the effluvia of the ſtone, as to ſhew the courſe they take every way. In the middle of each pole, between A B and C D, they appear to proceed in lines nearly ſtraight; towards the ends they are more and more curved, till at laſt the lines from both ſides coinciding with each other, form numberleſs curves round the ſtone, which are nearly of a circular figure, as in the plate. This experiment ſeems to ſhew that the magnetic effluvia iſſuing from one pole, circulates to the other.

2. ONE pole of a magnet will attract iron, and the other repel it, but no other body. The property of the magnet to attract

attract iron has been known many ages: but thoſe of its polar direction, and of its communicating that property to iron, was not diſcovered till the 14th century.

3. The magnet attracts iron as well in vacuo, as in the air.

4. The magnetic attraction will be continued through ſeveral pieces of iron placed contiguous to each other.

5. The magnetic effluvia pervades all bodies.

6. The magnetic attraction extends to a conſiderable diſtance. The learned Muſchenbroek made a number of experiments, with great care and aſſiduity, to determine the extent and progreſs of the magnetic attraction, but was never able to diſcover any regular proportion between the force and diſtance; but merely that the force increaſed as the iron approached the magnet. Nor does there ſeem to be any proſpect of eſtabliſhing the proportion of attraction to the diſtance, till a method is found, if it can be found, of ſeparating the attracting from the repelling parts. A needle has been known to be attracted by an iron bar at the diſtance of eight or ten feet.

7. The north pole of one magnet will attract the ſouth pole of another: and the ſimilar poles will repel each other. If a magnet be gently cut through the middle of its axis, each piece becomes a complete magnet; for the parts that were contiguous become poles, and even oppoſite poles. So that the end of each piece may become a north or ſouth pole according as the ſection is made neareſt to the north or ſouth pole of the large magnet. Upon cutting a magnet longitudinally, there will be four poles, in the ſame poſition as before the cutting. Sometimes a ſtrong ſtroke with a hammer will bring all the magnetic power from one end of a needle to the other; ſometimes make it more ſtrong where it was before, and at other times totally deſtroy it.

8. The end of a needle touched by the north pole of a magnet will turn ſouth, and that touched by the ſouth pole will turn north.

9. The declination of the magnetic needle is different in different parts of the earth, and in the ſame part at different times. The declination of the needle at London, in the year 1580, was 11 degrees 15 minutes eaſt. In the year 1657, there was no declination, that is, the needle ſtood exactly

north and ſouth. At preſent, the declination is more than 22 degrees weſtward.

10. THE inclination of the needle is not always the ſame in different places, nor at the ſame place at different times. The inclination of the needle when it was firſt obſerved, in the year 1576, was found to be 71 degrees 50 minutes: at preſent it is between 74 and 75 degrees.

To prevent the dipping of the needle in the common compaſs, the end that is not touched is made ſomething heavier, by which it is kept in equilibrio. Under the equator the needle has no inclination, being equally attracted by the two poles of the earth.

11. THE ſtrength of natural magnets differs in thoſe of different magnitudes, but not in proportion to their magnitudes. The ſmalleſt magnets have generally the greateſt power, in proportion to their bulk. A large magnet will ſeldom take up more than three or four times its own weight; whereas a ſmall one will frequently take up more than ten times its weight. A magnet that weighs ſcarce three grains, and that a gentleman wears in his ring, will take up 746 grains, or 250 times its own weight. A magnetic bar made by Mr. Canton, according to the method we ſhall hereafter deſcribe, and that weighed 10 ounces 12 pennyweights, took up ſomething more than 79 ounces; and a flat ſemicircular ſteel magnet that weighed an ounce and 13 pennyweights, lifted an iron wedge of 90 ounces.

12. THE ſtrength of a natural magnet is conſiderably increaſed by its being armed. There are various ways of arming magnets; the moſt eligible ſeems to be that of placing two pieces of ſteel againſt the two poles, ſo that they may come down below the bottom of the ſtone, and binding them on with one or more pieces of braſs; the two ends of the ſteel pieces then become the poles of the magnet. To determine the quantity of ſteel to be applied, try the magnet with ſeveral ſteel bars, and the greateſt weight it takes up, with a bar on, is to be the weight of its armour.

THOUGH an armed magnet has a great degree of force, it may be eaſily counteracted. If an oblong piece of iron be ſuſpended by one of its poles, and the pole of a different denomination of a weaker and unarmed magnet be placed under the iron, it will quit the firſt magnet and adhere to the other. In like manner when a needle hangs by its point to a magnet, if

if a common bar of iron be applied to the head of the needle, it will directly quit the magnet and adhere to the bar: but if it hangs by its head to the magnet, neither the iron, nor a weak magnet, will diſengage it. Though the pole of an armed magnet has great power, yet if an iron bar of great length be placed under it, the magnet will not appear to have any force whatever.

If a magnet, by laying a long time unuſed, has loſt part of its power, it may ſometimes be recovered. An armed magnet that weighed 14 ounces and a half, and would take up 16 times its own weight, by laying by ſome years loſt one fourth part of its power. But as much weight being applied to it, as it would then take up, and being ſuffered to hang to it ſome weeks, it would then take up an additional quantity; and the quantity being continually increaſed, at different periods, for the ſpace of two years, it would then take up more than 20 pounds, whereas, before its virtue was impaired, it would not take up 15.

13. Iron acquires a magnetic power by being continually rubbed in the ſame direction. From hence files, augurs, and ſuch like tools, have always ſome magnetic power.

14. Iron bars become magnetic by ſtanding a long time nearly upright. Therefore pokers, tongs, and other irons, that always ſtand with the ſame end downwards, are conſtantly magnetic; and the continual friction they receive, in keeping them clean, contributes much to this. Some bars acquire ſeveral magnetic poles, alternately, North and South.

15. The magnetic virtue may be communicated by electricity. When the electric ſhock is very ſtrong it will give a polarity to needles; and ſometimes it will reverſe their poles.

16. A strong blow at the end of a magnetic bar, will give it a magnetic power. If ſuch a bar, or a pair of pincers, be ſtruck hard, or thrown forcibly againſt a ſtone floor, they will manifeſtly attract a ſmall needle that floats upon the ſurface of the water in a glaſs.

17. Fire totally deſtroys the power of magnets, as well natural as artificial.

Method

Method of making Artificial Magnets.

PROCURE a dozen bars; ſix of ſoft ſteel, each three inches long, a quarter of an inch broad, and one twentieth of an inch thick, with two pieces of iron, each half the length of one of the bars, but of the ſame breadth and thickneſs; and ſix of hard ſteel, each five inches and a half long, half an inch broad, and three twentieths of an inch thick, with two pieces of iron of one half the length, but the ſame breadth and thickneſs as one of the hard bars; and let all the bars be marked with a line quite round them at one end.

THEN take an iron poker and tongs (Plate IV. Fig. 2.) the larger they are and the longer they have been uſed, the better; and fixing the poker upright between the knees, hold to it near the top, one of the ſoft bars, having its marked end downward, by a piece of ſewing ſilk, which muſt be pulled tight with the left hand, that the bar may not ſlide: then graſping the tongs with the right hand, a little below the middle, and holding them nearly in a vertical poſition, let the bar be ſtroked, by the lower end, from the bottom to the top, about ten times on each ſide, which will give it a magnetic power ſufficient to lift a ſmall key at the marked end; which end, if the bar was ſuſpended on a point, would turn towards the north, and is therefore called the north pole, and the unmarked end is, for the ſame reaſon called the ſouth pole of the bar.

FOUR of the ſoft bars being impregnated after this manner, lay the other two (Fig. 3.) parallel to each other, at the diſtance of about a quarter of an inch, between the two pieces of iron belonging to them, a north and a ſouth pole againſt each piece of iron: then take two of the four bars already made magnetical, and place them together, ſo as to make a double bar in thickneſs, the north pole of one even with the ſouth pole of the other; and the remaining two being put to theſe in ſuch manner as to have two north and two ſouth poles together, ſeparate the north from the ſouth poles at one end, by a large pin, and place them perpendicularly with that end downwards, on the middle of one of the parallel bars, the two north poles towards its ſouth, and the two ſouth poles towards its north end: ſlide them backward and forward, three or four times, the whole length of the bar; and removing them from the middle of this, place them on the middle of the

the other bar as before directed, and go over that in the ſame manner: then turn both the bars the other ſide upwards, and repeat the former operation: this being done, take the two from between the pieces of iron, and placing the outermoſt of the touching bars in their room, let the other two be the outermoſt of the four to touch theſe with: and this proceſs being repeated till each pair of bars have been touched three or four times over, which will give them a conſiderable magnetic power, put the half dozen together after the manner of the four, (Fig. .) and touch with them two pair of hard bars, placed between their irons, at the diſtance of about half an inch from each other: then lay the ſoft bars aſide, and with the four hard ones let the other two be impregnated, (Fig.) holding the touching bars apart, at the lower end, near two tenths of an inch, to which diſtance let them be ſeparated, after they are ſet on the parallel bar, and brought together again before they are taken off.

THIS being obſerved, proceed according to the method deſcribed above till each pair has been touched two or three times over. But as this vertical way of touching a bar will not give it quite ſo much of the magnetic virtue as it will receive, let each pair be now touched once or twice over, in their parallel poſition between the irons, (Fig.) with two of the bars held horizontally, or nearly ſo; by drawing at the ſame time the north of one from the middle over the ſouth end, and the ſouth of the other from the middle over the north end of a parallel bar: then bringing them to the middle again, without touching the parallel bar, give three or four of theſe horizontal ſtrokes to each ſide. The horizontal, touch after the vertical, will make the bars as ſtrong as they can poſſibly be made; as appears by their not receiving any additional ſtrength, when the vertical touch is given by a great number, and the horizontal, by bars of a ſuperior magnetic power. This whole proceſs may be gone through in about half an hour; and each of the large bars, if well hardened, may be made to lift 28 troy ounces; and ſometimes more. And when theſe bars are thus impregnated, they will give to an hard bar of the ſame ſize, its full virtue in leſs than two minutes; and therefore will anſwer all the purpoſes of magnetiſm in navigation and experimental philoſophy, much better than the loadſtone, which is well known not to have ſufficient power to impregnate hard bars. The half dozen being put into a

caſe,

caſe, (Fig. 7,) in ſuch manner, as that two poles of the ſame denomination may not be together, and their irons with them as one bar, they will retain the virtue they have received. But if their power ſhould, by making experiments, be ever ſo far impaired, it may be reſtored without any foreign aſſiſtance in a few minutes. And if, out of curioſity, a much larger ſet of bars ſhould be required, theſe will communicate to them a ſufficient power to proceed with, and they may in a ſhort time, by the ſame method, be brought to their full ſtrength.

The Magnetic Perſpective Glaſs.

PROVIDE an ivory tube, about two inches and a half long, and of the form expreſſed in Plate V. Fig. 1. The ſides of this tube muſt be thin enough to admit a conſiderable quantity of light. It is to open at one end with a ſcrew: at that end there muſt be placed an eye glaſs A, Fig. 2. of about two inches focus, and at the other end any glaſs you pleaſe.

HAVE a ſmall magnetic needle, like that placed on a compaſs. It muſt be ſtrongly touched, and ſo placed at the bottom of the tube, that it may turn freely round. It is to be fixed on the center of a ſmall ivory circle, C, of the thickneſs of a counter, which is placed on the object glaſs D, and painted on the object glaſs D, and painted black on the ſide next it. This circle muſt be kept faſt by a circular rim of peſteboard, that the needle may not riſe off its pivot, after the ſame manner as in the compaſs. This tube will thus become a compaſs ſufficiently tranſparent to ſhew the motions of the needle. The eye-glaſs ſerves more clearly to diſtinguiſh the direction of the needle; and the glaſs at the other end, merely to give the tube the appearance of a common perſpective.

IT will appear, by aphoriſm 8, that the needle in this tube, when placed over, and at a ſmall diſtance from a magnet, or any machine in which it is contained, will neceſſarily place itſelf in a poſition directed by that magnet, and conſequently ſhew where the north and ſouth pole of it is placed. The north end of the needle conſtantly pointing to the ſouth end of the magnet.

THIS effect will take place though the magnet be incloſed in a caſe of wood, or even metal, as the magnetic effluvia penetrates all bodies. You muſt obſerve, however, that the attracting

tracting magnet muſt not be very far diſtant from the needle, eſpecially if it be ſmall, as in that caſe its influence extends but to a ſhort diſtance.

THIS tube may be differently conſtructed, by placing the needle in a perpendicular direction, on a ſmall axis of iron, on which it muſt turn quite freely, between two ſmall plates of braſs placed on each ſide the tube: the two ends of the needle ſhould be in exact equilibrium. The north and ſouth ends of this needle will, in like manner, be attracted by the ſouth and north ends of the magnetic bar. The former conſtruction, however, appears preferable, as it is more eaſily excited, and the ſituation of the needle much more eaſily diſtinguiſhed.

The Magnetic Table.

UNDER the top of a common table place a magnet that turns on a pivot, and fix a board under it, that nothing may appear. There may alſo be a drawer under the table, which you pull out to ſhew that there is nothing concealed. At one end of the table there muſt be a pin that communicates with the magnet, and by which it may be placed in different poſitions: this pin muſt be ſo placed as not to be viſible by the ſpectators. Strew ſome ſteel filings, or very ſmall nails over that part of the table where the magnet is; then aſk any one to lend you a knife, or a key, which will then attract part of the nails or filings, in the ſame manner as the iron attracts the needle, as may be ſeen in the 12th aphoriſm. Then placing your hand, in a careleſs manner, on the pin at the end of the table, you alter the poſition of the magnet; and giving the key to any perſon, you deſire him to make the experiment, which he will then not be able to perform. You then give the key to another perſon, at the ſame time placing the magnet, by means of the pin, in the firſt poſition, when that perſon will immediately perform the experiment.

The communicative Crown.

TAKE a crown piece, and bore a hole in the ſide of it, in which place a piece of wire, or a large needle, well poliſhed, and ſtrongly touched with a magnet. Then cloſe the hole with a ſmall piece of pewter, that it may not be perceived. Now the needle in the magnetic perſpective (before deſcribed,) when it is brought near to this piece of money, will fix itſelf

in

in a direction correſpondent to the wire or needle in that piece.

DESIRE any perſon to lend you a crown piece, which you dexterouſly change for one that you have prepared as above. Then give the latter piece to another perſon, and leave him at liberty either to put it privately in a ſnuff-box, or not; he is then to place the box on a table, and you are to tell him, by means of your glaſs, if the crown is or is not in the box. Then bringing your perſpective cloſe to the box, you will know, by the motion of the needle, whether it be there or not; for as the needle in the perſpective will always keep to the north of itſelf, if you don't perceive it has any motion, you conclude the crown is not in the box. It may happen, however, that the wire in the crown may be placed to the north, in which caſe you will be deceived. Therefore to be ſure of ſucceſs, when you find the needle in the perſpective remain ſtationary, you may make ſome pretence to deſire the perſon to move the box into another poſition, by which you will certainly know if the crown piece be there or not.

YOU muſt remember, that the needle in the perſpective muſt here be very ſenſible, as the wire in the crown cannot poſſibly have any great attractive force.

The Magician's Mirrors.

IN the wainſcot of a room make two overtures, of a foot high and ten inches wide, and about a foot diſtant from each other. Let them be at the common height of a man's head, and in each of them place a tranſparent glaſs, ſurrounded with a frame like a common mirror.

BEHIND this partition place two mirrors, one on the outward ſide of each overture, inclined to the wainſcot in an angle of forty-five degrees *: let them both be eighteen inches ſquare: let all the ſpace between them be encloſed by boards or paſteboard, painted black, and well cloſed, that no light may enter; let there be alſo two curtains to cover them, which may be drawn aſide at pleaſure.

WHEN a perſon looks into one of theſe ſuppoſed mirrors, inſtead of ſeeing his own face he will perceive the object that is in the front of the other; ſo that if two perſons preſent themſelves

* Every square or right angle is 90 degrees, half of which is 45, and is readily formed by making the two angles equal.

themſelves at the ſame time before theſe mirrors, inſtead of each one ſeeing himſelf, they will reciprocally ſee each other.

NOTE. There ſhould be a ſconce with a candle placed on each ſide of the two glaſſes in the wainſcot, to enlighten the faces of the perſons who look in them, otherwiſe this experiment will have no remarkable effect.

THIS recreation may be conſiderably improved by placing the two glaſſes in the wainſcot, in adjoining rooms, and a number of perſons being previouſly placed in one room, when a ſtranger enters the other, you may tell him his face is dirty, and deſire him to look in the glaſs, which he will naturally do; and on ſeeing a ſtrange face he will inſtantly draw back: but returning to it, and ſeeing another, another, and another, like the phantom kings in Macbeth, what his ſurpriſe will be is more eaſy to conceive than expreſs. After this, a real mirror may be privately let down on the back of the glaſs, and if he can be prevailed on to look in it once more, he will then, to his farther aſtoniſhment, ſee his own face; and may be told, perhaps perſuaded, that all he thought he ſaw before was mere imagination.

How many tricks leſs artful than this, have paſſed in former times for ſorcery? and paſs at this time, in ſome countries, for apparitions.

NOTE. When a man looks in a mirror that is placed perpendicular to another, his face will appear entirely deformed. If the mirror be a little inclined, ſo as to make an angle of eighty degrees (that is one ninth part from the perpendicular) he will then ſee all the parts of his face except the noſe and forehead. If it be inclined to ſixty degrees, (that is one third part) he will appear with three noſes and ſix eyes: in ſhort, the apparent deformity will vary at each degree of inclination; and when the glaſs comes to forty five degrees, (that is, half way down) the face will vaniſh. If inſtead of placing the two mirrors in this ſituation, they are ſo diſpoſed that their junction may be vertical, their different inclinations will produce other effects; as the ſituation of the object relative to theſe mirrors is quite different. The effects of theſe mirrors, though remarkable enough, occaſion but little ſurprize, as there is no method of concealing the cauſe by which they are produced.

Polemoſcopes.

BY the term polemoſcope is meant any inſtrument, whether catoptric or dioptric, by which you may ſee what paſſes in another place, without being ſeen from thence. The machines contain one or more plain mirrors, which convey by reflection the image of the object to the eye of the ſpectator. There are ſmall inſtruments of this kind, made in the form of an opera glaſs, by which, while you ſeem to look ſtrait forward, you ſee what paſſes on one ſide, and by that means gratify your curioſity without the appearance of incivility.

To the conſtructing of this ſort of polemoſcope, nothing more is neceſſary than to fix in a common opera-glaſs, a ſmall mirror inclined to an angle of forty-five degrees, and adjuſt a proper object-glaſs. This glaſs at the ſame time may anſwer its common uſe, by adding an object-glaſs, and ſo contriving the ſmall tube that it may remove the mirror at pleaſure.

THE tube of a polemoſcope may be placed againſt a wall, the inclined mirror being a little above it, and turned outwards: by which means you will diſcover what paſſes on the other ſide, without being ſeen yourſelf. An inſtrument of this ſort would be of uſe in ſieges, where there is danger without the wall from the fire of the enemy, and on other occaſions. This inſtrument may alſo be conſtructed that the tube may turn round, and the mirror be elevated or depreſſed, that you may ſee ſucceſſively, and at pleaſure, all the objects that you would perceive, if you were at the top of the wall againſt which the inſtrument is placed.

The Artificial Rainbow.

OPPOSITE a window into which the ſun ſhines direct, ſuſpend a glaſs globe filled with water, by a ſtring that runs over a pulley, ſo that the ſun's rays may fall on it. Then drawing the globe gradually up, when it comes to the height of about forty degrees, you will ſee, by placing yourſelf in a proper ſituation, a purple colour in the glaſs, and by drawing it gradually up higher, the other priſmatic colours, blue, green, yellow, and red, will ſucceſſively appear; after which the colours will diſappear, till the globe is raiſed to about fifty degrees, when they will again be ſeen, but in an inverted order, the red appearing firſt, and the blue or violet laſt: and when the globe comes

comes up to little more than fifty-four degrees, they will totally vaniſh.

THESE appearances ſerve to explain the phenomena of natural rainbows, of which there are frequently two; the one being about eight degrees above the other, and the order of their colours is inverted, as in this experiment, red being the uppermoſt colour in the lower bow, and violet the other.

THE rainbow is not in the clouds, but in the falling rain, and always oppoſite the ſun. The different order of the colours in the bows ariſes from their different reflections; thoſe of the under bow being cauſed by two refractions and two reflections, and therefore the colours of this are leſs bright than the other, their ſtrength being diminiſhed by every reflection.

Now, it has been proved by repeated experiments, that forty degrees form the greateſt angle by which the moſt refrangible rays can, after one reflection, be refracted to the eye; and that ſomething more than forty-two degrees forms the greateſt angle, under which the leaſt refrangible ray can come to the eye after one reflection. Therefore, all the colours of the lower bow muſt lie in the ſpace of leſs than two degrees. In like manner it has been proved, that fifty degrees make the leaſt angle under which the leaſt refrangible rays can be viſible to the eye after two reflections; and that about fifty-four degrees will be the leaſt angle under which the moſt refrangible rays can come to the eye after two reflections. Therefore, all the colours of the upper bow muſt be in leſs than four degrees.

IT follows from what is here ſaid, that all rainbows are of a circular form and equal magnitude, and as they are always oppoſite the ſun, the parts we ſee of them muſt be in proportion to his height above the horizon: when his altitude is forty degrees, only the upper rainbow can be viſible, and when it is fifty-four degrees there can be no rainbow; but as the ſun's height, during the winter half year, it never equal to forty degrees, there may be always then two bows viſible.

By the Means of two plain Looking-Glaſſes, to make a Face appear under different Forms.

HAVING placed one of the two glaſſes horizontally, raiſe the other to about right angles over the firſt; and while the two glaſſes continue in this poſture, if you come up to the

perpendicular glaſs, you will ſee your face quite deformed and imperfect; for it will appear without forehead, eyes, noſe, or ears, and nothing will be ſeen but a mouth and a chin raiſed bold. Do but incline the glaſs ever ſo little from the perpendicular, and your face will appear with all its parts, excepting the eyes and the forehead. Stoop a little more, and you will ſee two noſes and four eyes; and then a little further, and you will ſee three noſes and ſix eyes. Continue to incline it ſtill a little more, and you will ſee nothing but two noſes, two mouths, and two chins; and then a little further again, and you will ſee one noſe and one mouth. At laſt incline a little further, that is, till the angle of inclination comes to be 44 degrees, and your face will quite diſappear.

If you incline the two glaſſes, the one towards the other, you will ſee your face perfect and entire; and by the different inclinations, you will ſee the repreſentation of your face, upright and inverted alternately, &c.

By the Means of Water to make a Counter appear, that while the Veſſel was empty of Water was hid from the Eye.

TAKE an empty veſſel and put a counter in it at ſuch a diſtance from the eye, that the height of the ſides of the veſſel keeps it hid; you may make the eye to ſee this counter without altering the place of either the eye, the veſſel, or the counter, viz. by pouring water into it; for as ſight, which is performed in a ſtraight line, does, upon encountering a thicker medium, refract towards a perpendicular, ſo in this caſe the water poured into the veſſel being a thicker medium than the air, will make the rays darted from the eyes to refract towards the line that is perpendicular to its ſurface; and ſo the eye will ſee the counter at the bottom of the veſſel, which without that refraction could not be ſeen.

To know which of two different Waters is the lighteſt, without any Scales.

TAKE a ſolid body, the ſpecific gravity of which is leſs than that of water, deal, or fir-wood, for inſtance, and put it into each of the two waters, and reſt aſſured that it will ſink deeper in the lighter than in the heavier water; and ſo by obſerving the difference of the ſinking, you will know which is the lighteſt water, and conſequently the wholſomeſt for drinking.

To contrive a Caſk to hold three different Liquors, that may be drawn unmixed at one and the ſame Tap.

THE caſk (Pl. V. Fig. 3.) muſt be divided into three parts or cells, A, B, C, for containing the three different liquors, as red wine, white wine, and water; which you may put into their reſpective cells at one and the ſame bung, thus;

PUT into the bung a funnel D with three pipes, E, F, G, each of which terminates in its reſpective cell. Upon this funnel clap another funnel H with three holes, that may anſwer when you fill the orifices of each pipe; for thus, if you turn the funnel H ſo as to make each hole anſwer ſucceſſively to its correſponding pipe, the liquor you pour into the funnel H will enter that pipe, it being ſtill ſuppoſed that when one pipe is open, the other two are ſhut.

NOW to draw theſe liquors without mixing, you muſt have three pipes, K, L, M, each of which anſwers to a cell, and a ſort of cock or ſpigot I N with three holes anſwering the three pipes, and ſo turning it till one of the holes fits its reſpective pipe, you draw the reſpective liquor by itſelf.

To know if a ſuſpicious Piece of Money is good or bad.

IF it be a piece of ſilver that is not very thick, as a crown or half a crown, the goodneſs of which you want to try: Take another piece of good ſilver of equal balance with it, and tie both pieces with thread or horſe-hair to the ſcales of an exact balance (to avoid the wetting of the ſcales themſelves) and dip the two pieces thus tied in water; for then if they are of equal goodneſs, that is, of equal purity, they will hang in equilibrio in the water as well as in the air: but if the piece in queſtion is lighter in the water than the other, it is certainly falſe, that is, there is ſome other metal mixed with it that has leſs ſpecific gravity than ſilver, ſuch as copper; if it is heavier than the other, it is likewiſe bad, as being mixed with a metal of greater ſpecific gravity than ſilver, ſuch as lead.

IF the piece propoſed is very thick, ſuch as that crown of gold that Hiero, king of Syracuſe, ſent to Archimedes to know if the goldſmith had put into it all the eighteen pounds of gold that he had given him for that end; take a piece of pure gold of equal weight with the crown propoſed, *viz.* eighteen pounds; and without taking the trouble of weighing

them in water, put them into a veſſel full of water, one after another, and that which drives out moſt water, muſt neceſſarily be mixed with another metal of leſs ſpecific gravity than gold, as taking up more ſpace though of equal weight.

To find the Burden of a Ship at Sea, or in the River.

IT is a certain truth, that a ſhip will carry a weight equal to that of a quantity of water of the ſame bigneſs with itſelf: ſubtracting from it the weight of the iron about the ſhip, for the wood is of much the ſame weight with water; and ſo if it were not for the iron a ſhip might ſail full of water.

THE conſequence of this is, that, however a ſhip be loaded, it will not ſink quite, as long as the weight of its cargo is leſs than that of an equal bulk of water. Now to know this bulk or extent, you muſt meaſure the capacity or ſolidity of the ſhip, which we here ſuppoſe to be 1000 cubical feet, and multiply that by 73 pounds, the weight of a cubical foot of ſea water; for then you have in the product 73000 pounds for the weight of a bulk of water equal to that of the ſhip.

So that in this example we may call the burden of the ſhip 73000 pounds, or 36 ton and a half, reckoning a ton 2000 pounds, that being the weight of a ton of ſea water. If the cargo of this ſhip exceeds 36 ton and a half ſhe will ſink; and if her loading is juſt 73000lb. ſhe will ſwim very deep in the water upon the very point of ſinking; ſo that ſhe cannot ſail ſafe and eaſy, unleſs her loading be conſiderably ſhort of 73000 pounds weight. If the loading comes near to 73000 pounds, as being, for example, juſt 36 ton, ſhe will ſwim at ſea, but will ſink when ſhe comes into the mouth of a freſh water river; for this water being lighter than ſea water will be ſurmounted by the weight of the veſſel, eſpecially if that weight is greater than the weight of an equal bulk of the ſame water.

When two Veſſels or Cheſts are like one another, and of equal Weight, being filled with different Metals, to diſtinguiſh the one from the other.

THIS is eaſily reſolved, if we conſider that two pieces of different metals of equal weight in air, do not weigh equally in water, becauſe that of the greateſt ſpecific gravity takes up a leſſer ſpace in water; it being a certain truth, that, any metal weighs leſs in water than in air, by reaſon of the water

the

the room of which it fills. For example, if the water weighs a pound, the metal will weigh in that water a pound leſs than in the air. This gravitation diminiſhes more or leſs according as the ſpecific gravity of the metal is greater than that of the water.

We will ſuppoſe then two cheſts perfectly like one another, of equal weight in the air, one of which is full of gold, and the other of ſilver; we weigh them in water, and that which then weighs down the other muſt needs be the gold cheſt, the ſpecific gravity of gold being greater than that of ſilver, which makes the gold loſe leſs of its gravitation in water than ſilver. We know by experience, that gold loſes in water about an eighteenth part only, whereas ſilver loſes near a tenth part: ſo that if each of the two cheſts, weighs in the air, for example, 180 pounds, the cheſt that is full of gold will loſe in the water ten pounds of its weight; and the cheſt that is full of ſilver will loſe eighteen, that is, the cheſt full of gold will weigh 170 pounds, and that of ſilver only 162.

Or, if you will, conſidering that gold is of a greater ſpecific gravity than ſilver, the cheſt full of gold, though ſimilar and of equal weight with the other, muſt needs have a leſſer bulk than the other. And therefore, if you dip ſeparately each of them into a veſſel full of water, you may conclude that the cheſt which expels leſs water, has the leſſer bulk, and conſequently contains the gold.

To meaſure the Depth of the Sea.

TIE a great weight to a very long cord, or rope, and let it fall into the ſea till you find it can deſcend no further, which will happen when the weight touches the bottom of the ſea, if the quantity or bulk of water, the room of which is taken up by the weight, and the rope, weighs leſs than the weight and rope themſelves; for if they weighed more, the weight would ceaſe to deſcend, though it did not touch the bottom of the ſea.

Thus one may be deceived in meaſuring the length of a rope let down into the water, in order to determine the depth of the ſea; and therefore to prevent miſtakes, you had beſt tie to the end of the ſame rope, another weight heavier than the former, and if this weight does not ſink the rope deeper than the other did, you may reſt aſſured that the length of the rope is the true depth of the ſea; if it does ſink the rope deeper, you muſt tie

a

a third weight yet heavier, and ſo on, till you find two weights of unequal gravitation that run juſt the ſame length of the rope, upon which you may conclude, that the length of the wet rope is certainly the ſame with the depth of the ſea.

To make a Deaf Man hear the Sound of a Muſical Inſtrument.

IT muſt be a ſtringed inſtrument, with a neck of ſome length, as a lute, a guitar, or the like; and before you begin to play, you muſt by ſigns direct the deaf man to take hold with his teeth of the end of the neck of the inſtrument; for then if one ſtrikes the ſtrings with the bow one after another, the ſound will enter the deaf man's mouth, and be conveyed to the organ of hearing through the hole in the palate: and thus the deaf man will hear with a great deal of pleaſure, the ſound of the inſtrument, as has been ſeveral times experienced. Nay, thoſe who are not deaf, may make the experiment upon themſelves, by ſtopping their ears ſo as not to hear the inſtrument, and then holding the end of the inſtrument in their teeth, while another touches the ſtrings.

To make an Egg enter a Vial without Breaking.

LET the neck of a vial be ever ſo ſtraight, an egg will go into it without breaking, if it be firſt ſteeped in very ſtrong vinegar, for in proceſs of time the vinegar does ſo ſoften it, that the ſhell will bend and extend lengthways without breaking. And when it is in, cold water thrown upon it will recover its primitive hardneſs, and, as Cardan ſays, its primitive figure.

To hold a Glaſs full of Water with the Mouth down, ſo that the Water ſhall not run out.

TAKE a glaſs full of water, cover it with a cup that is a little hollow, inverting the cup upon the glaſs; hold the cup firm in this poſition with one hand, and the glaſs with the other, then with a jerk turn the glaſs and the cup upſide down, and ſo the cup will ſtand upright, and the glaſs will be inverted, reſting its mouth upon the interior bottom of the cup. This done, you will find that part of the water contained in the glaſs will run out by the void ſpace between the bottom of the cup and the brim of the glaſs; and when that ſpace is filled, ſo that the water in it reaches the brim of the glaſs, all paſſage being then denied to the air, ſo that it cannot enter

enter the glaſs, nor ſucceed in the room of the water, the water remaining in the glaſs will not fall lower, but continue ſuſpended in the glaſs.

If you would have a little more water deſcend into the cup, you muſt with a pipe or otherwiſe draw the water out of the cup, to give paſſage to the air in the glaſs; upon which part of the water will fall into the glaſs till it has ſtopped up the paſſage of the air afreſh, in which caſe no more will come down; or, without ſucking out the water in the cup, you may incline the cup and glaſs ſo that the water in the cup ſhall quit one ſide of the brim of the glaſs, and ſo give paſſage to the air, which will then ſuffer the water in the glaſs to deſcend till the paſſage is ſtopped again.

This may likewiſe be reſolved by covering the brim of the glaſs that is full of water, with a leaf of ſtrong paper, and then turn the glaſs, as above; and without holding your hand any longer upon the paper, you will find it as it were glued for ſome time to the brim of the glaſs, and during that time the water will be kept in the glaſs.

The Myſterious Watch.

YOU deſire any perſon to lend you his watch, and aſk him if he thinks it will or will not go, when it is laid on the table. If he ſays it will, you place it over the end of the magnet, and it will preſently ſtop. You then mark with chalk, or a pencil, the preciſe point where you placed the watch, and moving the poſition of the magnet, you give the watch to another perſon, and deſire him to make the experiment, in which he not ſucceeding, you give it to a third perſon, at the ſame time replacing the magnet, and he will immediately perform the experiment.

The Magnetic Dial.

PROVIDE a circle of wood or ivory, of about five or ſix inches diameter, as Pl. V. Fig. 4. which muſt turn quite free on the ſtand B, in the circular border A: on the circle muſt be placed the dial of paſteboard C, whoſe circumference is to be divided into twelve equal parts, in which muſt be inſcribed the numbers from one to twelve, as on a common dial. There muſt be a ſmall groove in the circular frame A, to receive the paſteboard circle; and obſerve that the dial muſt be

be made to turn free, that it may go round without moving the circular border in which it is placed.

BETWEEN the paſteboard circle and the bottom of the frame, place a ſmall artificial magnet E, (Fig. 5,) that has a hole in its middle, or a ſmall protuberance. On the outſide of the frame place a ſmall pin P, which ſerves to ſhew where the magnetic needle I, that is placed on a pivot at the center of the dial, is to ſtop. This needle muſt turn quite free on its pivot, and its two ſides ſhould be in exact equilibrio.

THEN provide a ſmall bag, that has five or ſix diviſions, like a lady's work-bag, but ſmaller. In one of theſe diviſions put ſmall ſquare pieces of paſteboard, on which are wrote the numbers from one to twelve; and if you pleaſe you may put ſeveral of each number. In each of the other diviſions you muſt put twelve or more like pieces, obſerving that all the pieces in each diviſion muſt be marked with the ſame number.

NOW the needle being placed upon its pivot, and turned quickly about, it will neceſſarily ſtop at that point where the north end of the magnetic bar is placed: and which you previouſly know by the ſituation of the ſmall pin in the circular border.

YOU therefore preſent to any perſon that diviſion of the bag which contains the ſeveral pieces on which is wrote the number oppoſite to the north end of the bar, and tell him to draw any one of them he pleaſes. Then placing the needle on the pivot, you turn it quickly about, and it will neceſſarily ſtop, as we have already ſaid, at that particular number.

ANOTHER may be made with the ſame dial, by deſiring two perſons to draw, each of them, one number out of two different diviſions of the bag, and if their numbers, when added together, exceed twelve, the needle or index will ſtop at the number they exceed it: but if they do not amount to twelve, the index will ſtop at the ſum of thoſe two numbers. In order to perform this, you muſt place the pin againſt the number five, if the two numbers to be drawn from the bag be ten and ſeven: or againſt nine, if they be ſeven and two.

IF this be made immediately after the former, as it eaſily may, by dexterouſly moving the pin, it will appear ſtill the more extraordinary.

The Intelligent Fly.

AT the center of a box about ſix inches ſquare and one inch deep, (Pl. VI. Fig. 1,) place a pivot. Have a touched needle L, three inches and a half long, and at the end of it that is touched fix a fly made of enamel: the other end of the needle muſt be ſomewhat heavier, to keep it in equilibrio. This needle is to be placed on the pivot.

ON a piece of ſquare paſteboard that will juſt go into the box, draw a circle, ABCD, three inches and a half diameter; and another at a ſmall diſtance, concentric with the former. The part within the laſt circle muſt be cut out. This paſteboard circle is to be placed about half an inch from the bottom of the box, and divided into ten equal parts, in which are to be wrote the letters A, E, I, O, U, D, G, L, N, R, as in the figure.

PLACE a glaſs about half an inch above the circle, and cover it with a circle of paper C, large enough to hide the needle, and leave only the fly viſible; on this paper you may paint ſome allegoric figures, that its uſe may not be ſuſpected. You muſt next write on 24 cards the following queſtions These cards are to be packed and ſhuffled, ſo that they may be in the order the queſtions are here placed.

Queſtions.

1. WHICH is the land of liberty? 2. Which is the firſt city in the world? 3 Whom do many men deſpiſe, though they have not half his merit? 4. Who is the pooreſt man in the world? 5. Who is the meaneſt of all mankind? 6. For what do all young women long? 7. Who, by ſtation, is the moſt miſerable of all beings? 8. By what does a man diſcover his weakneſs? 9. What would every married woman do if ſhe could? 10. In what does a man ſhew his pride and folly? 11. What makes a woman cry more than the loſs of her huſband? 12. How does a man talk who has nothing to ſay? 13. What moſt reſembles a fine lady? 14. What frequently reminds us of a great loſs without giving diſguſt? 15. Wha makes a young women in love with an old man? 16. What does the poet want to cover his empty ſcull? 17. What ſhould a man never take from the woman he loves? 18. What muſt that man be who would gain the eſteem of all? 19. Who is he that ſeeks a man's company when his money and friends are all

all gone? 20. What gains the good will of the phyſician, the lawyer, and the harlot? 21. What do good men revere and knaves abuſe? 22. What does a man depend on when he truſts to his friends for ſupport? 23. What can he be ſure of who leaves his affairs to another? 24. What makes as great a difference almoſt, if not altogether, between this man and that, as between that and a brute?

AFTER you have ranged the cards in the manner before-mentioned, you place them on the table, and aſk any perſon which of them, in the order they then ſtand, ſhall contain the queſtion to which the fly ſhall give him the anſwer. As he ſays, for example, your confederate, who has the following copy of the anſwers, will make the needle, at the end of which the fly is, ſucceſſively point to the letters that compoſe that word: then counting the cards over till you come to the 20th, you will find that word anſwer the queſtion.

Anſwers.

1. England. 2. London. 3. A dog. 4. A niggard. 5. A liar. 6. A ring. 7. A nun. 8. Anger. 9. Rule. 10. A duel. 11. An onion. 12. Loud. 13. An angel. 14. A dial. 15. Gold. 16. A laurel. 17. A denial. 18. Generous. 19. A dunn. 20. A guinea. 21. Religion. 22. A reed. 23. Ruin. 24. Learning.

MANY others may be performed by this intelligent fly, by numbers, cards, &c. ſimilar to thoſe we have already explained on other occaſions, and which, to avoid the appearance of repetition, we ſhall not here deſcribe.

To break a Pole or Cylindrical Staff, the extremes of which ſhall be laid upon two Glaſſes, without hurting the ſaid Glaſſes.

TAKE two equal tumblers, or wine glaſſes, which fill with water, and place them at ſuch a diſtance that the ends of the ſtaff may juſt reſt upon the edges of the glaſs, then with another ſtaff, ſtrike the one ſuſpended betwixt the two glaſſes juſt in the middle, and the ſtaff, if not very ſtrong, will be broke whilſt the glaſſes remain unhurt.

The real Apparition.

BEHIND the partition AB (Pl. VI. Fig. 2.) place in a poſition ſomething oblique, the concave mirror EF, which mu

be at leaſt ten inches in diameter, and its diſtance from the partition equal to three-fourths of the diſtance of its centre.

In the partition make an opening of ſeven or eight inches, either ſquare or circular; it muſt face the mirror, and be of the ſame height with it. Behind this partition place a ſtrong light, ſo diſpoſed, that it may not be ſeen at the opening, and may illumine an object placed at C, without throwing any light on the mirror.

Beneath the aperture in the partition place the object C, which you intend ſhall appear on the outſide of the partition, in an inverted poſition; and which we will ſuppoſe to be a flower. Before the partition, and beneath the aperture place a little flower-pot, D, the top of which ſhould be even with the bottom of the aperture, that the eye, placed at G, may ſee the flower in the ſame poſition as if its ſtalk came out of the pot.

Take care to paint the ſpace between the back part of the partition, and the mirror, black, to prevent any reflections of light from being thrown on the mirror; in a word, ſo diſpoſe the whole that it may be as little enlightened as poſſible.

When a perſon is placed at the point G, he will perceive the flower that is behind the partition, at the top of the pot at D, but on putting out his hand to pluck it, he will find that he attempts to graſp a ſhadow.

OBSERVATION.

The phenomena that may be produced by means of concave mirrors, are highly curious and aſtoniſhing. By their aid ſpectres of various kinds may be exhibited. Suppoſe, for example, you were to tell any one, that at ſuch an hour, and in ſuch a place, he ſhould ſee the apparition of an abſent or deceaſed friend (of whoſe portrait you are in poſſeſſion.) In order to produce this phantom, inſtead of the hole in the partition AB, in the laſt figure, there muſt be a door, which opens into an apartment to which there is a conſiderable deſcent. Under that door you are to place the portrait, which muſt be inverted and ſtrongly illuminated, that it may be lively reflected by the mirror, which muſt be large and well poliſhed. Then having introduced the incredulous ſpectator at another door, and placed him in the proper point of view,

you ſuddenly throw open the door at AB, when, to his great aſtoniſhment, he will immediately ſee the apparition of his friend.

It will be objected, perhaps, that this is not a perfect apparition, becauſe it is only viſible at one point of view, and by one perſon; but it ſhould be remembered, that it was an eſtabliſhed maxim in the laſt centuries, that a ſpectre might be viſible to one perſon and not to others. So Shakeſpeare makes both Hamlet and Macbeth ſee apparitions which were not viſible to others preſent at the ſame time. It is not unlikely moreover, that this maxim took its riſe from certain apparitions of this kind that were raiſed by the monks, to ſerve ſome purpoſes they called religious; as they alone were in poſſeſſion of what little learning there then was in the world.

There is one phenomenon we muſt not here omit; for tho' it be common enough it is alſo pleaſing, and eaſy to be performed. If you place yourſelf before a concave mirror, and at a proper diſtance, your figure will appear inverted, and if you ſtretch out your hand towards the mirror, you will perceive another hand that ſeems to meet and join it, though imperceptible to the touch. If inſtead of your hand you make uſe of a drawn ſword, and preſent it in ſuch manner that its point may be directed towards the focus of the parallel rays of the mirror, another ſword will appear, and ſeem to encounter that in your hand. You are to obſerve, that to make this experiment ſucceed well, you muſt have a mirror of at leaſt a foot in diameter, that you may ſee yourſelf in part. If you have a mirror large enough to ſee your whole perſon, the illuſion will be much more ſtriking. This phenomenon, with which ſo much parade has been made by ſome modern experimental philoſophers, was deſcribed by Baptiſta Porta, more than 200 years ſince.

A Solar Sonata.

IN a large caſe, ſuch as is uſed for dials and ſpring clocks, the front of which, or at leaſt the lower part of it, muſt be of glaſs, covered on the inſide with gauze, let there be placed a barrel organ, which, when wound up, is prevented from playing, by a catch that takes a toothed wheel at the end of the barrel. To one end of this catch there muſt be joined a wire, at the end of which there is a flat circle of cork, of the ſame dimenſions with the inſide of a glaſs tube, in which it is to

riſe

riſe and fall. This tube muſt communicate with a reſervoir that goes acroſs the front part of the bottom of the caſe, which it to be filled with ſpirits, ſuch as are uſed in thermometers, but not coloured, that it may be the better concealed by the gauze.

THIS caſe being placed in the ſun, the ſpirits will be rarefied by the heat, and riſing in the tube, will lift up the catch or trigger, and ſet the organ in play; which it will continue to do as long as it is kept in the ſun; for the ſpirits cannot run out of the tube, that part of the catch to which the circle is fixed being prevented from riſing beyond a certain point, by a check placed over it. Care muſt be taken to remove the machine out of the ſun before the organ runs down, that its ſtopping may be evidently effected by the cold.

WHEN the machine is placed againſt the ſide of a room on which the ſun ſhines ſtrong, it may conſtantly remain in the ſame place, if you incloſe it in a ſecond caſe, made of thick wood, and placed at a little diſtance from the other. When you want it to perform, it will only be neceſſary to throw open the door of the outer caſe, and expoſe it to the ſun.

BUT if the machine be moveable, it will perform in all ſeaſons by being placed before the fire; and in the winter it will more readily ſtop when removed into the cold.

A MACHINE of this ſort is ſaid to have been invented by Cornelius Dreble, in the laſt century. What the conſtruction of that was we know not, but might very likely be more complex, though it could ſcarcely anſwer the intention more readily.

An Automatous Harpſichord.

UNDER the keys of a common harpſichord let there be fixed a barrel, ſomething like that in a chamber organ, with ſtops or pins correſponding to the tunes you would have it play. Theſe ſtops muſt be moveable, ſo that the tunes may be varied at pleaſure. From each of the keys let there go a wire perpendicularly down; the ends of theſe wires muſt be turned up for about one-fourth of an inch. Behind theſe wires let there be an iron bar, to prevent them from going too far back. Now, as the barrel turns round, its pins take the ends of the wires, which pull down the keys, and play the harpſichord. The barrel and wires are to be all incloſed in a caſe.

In the chimney of the ſame room where the harpſichord ſtands, or at leaſt in one adjacent, there muſt be a ſmoke jack, from whence comes down a wire, or cord, that paſſing behind the wainſcot adjoining the chimney, goes under the floor, and up one of the legs of the harpſichord into the caſe, and round a ſmall wheel fixed on the axis of that firſt mentioned. There ſhould be pullies at different diſtances, behind the wainſcot and under the floor, to facilitate the motion of the cord.

This machinery may be applied to any other keyed inſtrument, as well as to chimes, and to many other purpoſes where a regular continued motion is required.

An inſtrument of this ſort may be conſidered as a perpetual motion, according to the common acceptation of the term, for it will never ceaſe going till the fire be extinguiſhed, or ſome parts of the machinery be worn out.

The Nocturnal Reveiller.

AGAINST the wall of a room, near the cieling, fix a wheel of 12 or 18 inches diameter; on the rim of which place a number of bells in tune, and, if you pleaſe, of different ſizes. To the axis of this wheel there ſhould be fixed a fly to regulate its motion; and round the circumference there muſt be wound a rope, to the end of which ſhould be hung a weight.

Near to the wheel let a ſtand be fixed, on which is an upright piece that holds a balance or moveable lever, on one end of which reſts the weight juſt mentioned, and to the other end muſt hang an inverted hollow cone, or funnel, the aperture of which is very ſmall. This cone muſt be graduated on the inſide, that the ſand put in may anſwer to the number of hours it is to run. Againſt the upright piece, on the ſide next the cone, there muſt be fixed a check, to prevent it from deſcending. This ſtand, together with the wheel, may be encloſed in a caſe, and ſo contrived as to be moved from one room to another with very little trouble

It is evident from the conſtruction of this machine, that when a certain quantity of the ſand is run out, the weight will deſcend, and put the wheel in motion, which motion will continue till the weight comes to the ground. If the wheel be required to continue longer in motion, two or more pullies may be added, over which the rope may run.

The

THE ſize of the bells ſhould be adapted to the ſomniferous diſpoſition of the party they are intended to rouſe: or if you pleaſe, a drum or tabor may be added, the ſtick to which may be fixed in the ſide of the room, by a ſwivel that goes through the middle of it; and one end of it being lifted up by teeth placed on the circumference of the wheel, the other end will alternately ſtrike the drum.

To make Water in a Glaſs ſeem to boil and ſparkle

TAKE a glaſs nearly full of water or other liquor, and ſetting one hand upon the foot of it to hold it faſt—turn ſlightly one of the fingers of your other hand upon the brim or edge of the glaſs (having before privately wet your finger) and ſo paſſing ſoftly on with your finger preſſing a little—then the glaſs will begin to make a noiſe—the parts of the glaſs will ſenſibly appear to tremble, with notable rarefaction and condenſation—the water will ſhake, ſeem to boil, caſt itſelf out of the glaſs, and leap out by ſmall drops, to the great aſtoniſhment of the obſervers, if they are ignorant of the cauſe—which is only the rarefaction of the parts of the glaſs occaſioned by the motion and preſſure of the finger.

END OF THE SECOND PART.

INSTRUCTIVE

QUERIES, PARODOXES,

ANAGRAMS, &c.

PART III.

Paradox.

ALL men will readily agree, that no one can tranſmit
A title to poſterity he never enjoyed—and yet
A certain honourable man, a baronet was born,
Altho' his father ne'er was one!—nor laugh my tale to ſcorn
When I affirm the title came by lineal deſcent—
But ſtrive to reconcile the ſame, for no deceit is in't.

Anſwer.

A BARONET, living in Weſtminſter city,
Whoſe father reſigning his breath
Before the old grandfather, was (which is pity)
Born after his grandfather's death;
Who, a baronet being, the infant became
Heir both to his title and pelf,
The minute when born, tho' his father the ſame
Had never enjoyed himſelf.

Enigma.

Enigma.

Ladies & Gentlemen,

I AM come to tell you in plain proſe, that I am a very great poet: Dactyles and Spondees are familiar to me—many of the moſt elegant productions of the age are indebted to me for no ſmall ſhare of their merit—I ſmooth their rugged numbers, and ſupply vacancies of wit.

SOMETIMES I am a fidler and conſequently ſomebody of note.

I OPEN the balls at court, and lead up the ragged regiment of St. Giles's. Your Giardini's and Geminiani's without me are leſs ſignificant than the poor blind ſcraper of Bedlam. I preſide over your concerts, and always make one with the four-and-twenty.

IN phyſic more renowned than the High German Doctor. Let ſtupid drones ſtudy—I practice. Without a word of Hypocrates I have done wonders—where the whole ſtiff-rumped faculty have failed. It ſtands on record that I have cured the fever; and for a certain diſtemper that ſhall be nameleſs, am a moſt amazing ſpecific.

As a dancing maſter, I as much excel the red-heeled petit maitres of the age, as roaſt beef and plumb pudding are beyond ſoup maigre les grenovilles fricaſſees. Avaunt ye minuet-mongers! No more of your coupees and your ballances! I teach without the clog of rules, and my pupils learn by inſtinct. I have taken an aukward bumpkin, without a grain of mercury in him, and led him like a tame bear through all the modes and attitudes of dancing; thus realizing the poet's fiction, and making beaſts dance after me.

NOR do I want activity myſelf as a dancer: I have hopped you many a hornpipe and rigadoon upon the tight rope.

I SERVED my time with a ſawyer, and there I learned— ſee-ſaw! My maſter was deſperately enamoured of Miſs K—Cripes, and uſed me as a ſpokeſman—I managed matters ſo well with her, that many's the good time and often I have made the ſlut's guts warble again. Offering once to ſalute her with greaſy lips, the nymph was ſtruck ſpeechleſs at the affront—and my maſter in a pet diſcarded poor Pill Garlic.

Anſwer.

A FIDDLESTICK.

Paradox

Paradox.

ONE grandfather and two grandſons—one father and his ſon;
Another with two other ſons (ſo ſtrange their kindred run;)
Two firſt couſins and two ſeconds—uncle and nephew dear;
But yet ſtill no more than four men there are included here,
And their ſurnames are all the ſame, 'tis true without all doubt,
Now all that is deſired, is to find the paradox out.

Anſwer.

A HAD a loving brother named E;
Who was own father unto maſter D,
Therefore A's D's own uncle as you ſee;
D married B's daughter (we'll ſuppoſe)
From whence B father and D ſon aroſe;
Then D (pray mind if I be right,) I ſay,
Muſt needs be grandſon to his uncle A:
But B and D firſt couſins were before,
Made two grandſons—two ſecond couſins more
Ariſes, when we find that C and D
Are brothers too (by marriage) unto B.

Anagram.

ONCE fam'd phyſician when tranſpos'd, a being great will
ſhew,
Who, when commiſſioned from above, takes care of men
below.

Anſwer.

THE phyſician Galen, when tranſpoſed will ſhew
That an Angel may guard a poor mortal below.

Paradox.

IF from ſix ye take nine, and from nine ye take ten,
Ye wits, (now the myſtery explain)
And if fifty from forty be taken, there then
Shall be juſt half a dozen remain.

Paradox.

NOTHING and ſix, with five hundred when fram'd,
Will tell you a poet in ancient times fam'd.

Anſwer.

Anſwers.

IF from ſIX ye take nine, and from IX take X,
And from XL take fifty, then SIX does remain;
A cypher and VI, with a D, when right fram'd,
Shews the poet's name OVID, in ancient times fam'd.

Query.

WHENCE aroſe the cuſtom of ſmoaking tobacco in England, and how long ſince?

Anſwer.

THE cuſtom of ſmoaking tobacco in England, aroſe about the year 1585, in the 27th of the reign of Queen Elizabeth, when one Mr. Ralph Lane, a military man of note, and a Captain Philip Amides, returned to England from the iſland Roanoke, at the mouth of Albemarle Sound. Mr. Lane and his company brought home ſome tobacco, the firſt (Mr. Camden thinks) brought into England. Sir Walter Raleigh, then in high vogue, and much eſteemed by the gay, as well as the gallant world, ſoon brought this odoriferous plant into much eſteem; ſo that many ladies as well as noblemen, made no ſcruple ſometimes to take a pipe—and which the Queen did not fail to encourage; and, ſome ſay, uſed it herſelf.

Query.

WHENCE aroſe the cuſtom of frying pancakes on Shrove-Tueſday, and how long ſince?

Anſwer.

ONE Simon Eyre, a ſhoemaker, being choſen lord-mayor of London, made a pancake feaſt on Shrove Tueſday, for all the apprentices in London; and from that it became a cuſtom.

He ordered, that upon ringing of a bell in every pariſh, the apprentices ſhould leave work, and ſhut up their ſhops for that day—which being ever ſince, yearly obſerved, is called the pancake bell. He made them a large feaſt of puddings, pies, and pancakes, and what remained when all had dined, was given to the poor. Then after in that year (1446) he built Leadenhall.

Query.

Query.

WHO was the firſt man that introduced coaches into England, and how long is it ſince?

Anſwer.

COACHES were firſt introduced into England in the year 1589, and hackney coaches in the year 1693. The firſt ſtateſman that ever ſet up this equipage, was John de Laval de Bois, Dauphin, who could not travel on horſeback on account of his enormous bulk. Queen Elizabeth, as we find by hiſtory, uſed to go even to the parliament houſe on horſeback.

Paradox.

I HAVE twelve times ſeen biſſextile, pray tell how that can be?
Since twelve times four make forty-eight, and I am but forty-three.

Anſwer.

IF a perſon be born on the 25th of February, and travel weſtward the globe about, he may ſee twelve biſſextile years before he be completely forty-four years of age, if he was born in a biſſextile year.

Paradox.

ONE and two when they're wrote down fair,
Will make one hundred, I declare.

Anſwer.

THE figure 1 and two 00's will make 100.

Paradox.

TAKE one from nineteen, the remainder you'll ſee,
Is twenty exactly—Pray how can this be?

Anſwer.

XIX make nineteen, from which take 1, there will remain XX.

Paradox.

COME tell to me what figures three,
When multiplied by four,

Make

Make five exact, 'tis truth in fact,
This unto me explore?

Answer.

In decimals 1.25 is $\frac{1}{4}$, which being multiplied by 4, the product is 5.

Paradox.

THE ſum of four figures in value will be,
Above ſeven thouſand, nine hundred and three:
But when they are halved, you'll find very fair
The ſum will be nothing, in truth to declare.

Anſwer.

The four figures are 8888, which, by drawing a line thro' the middle of the ſame thus $\frac{0000}{0000}$ the ſum will be eight 0's, or nothing.

Paradox.

SIX hundred and ſixty ſo ordered may be,
That if you divide the whole number by three
The quote will exactly in numbers expreſs,
The half of ſix hundred and ſixty, not leſs.

Anſwer.

IF the tails of the ſix's in the ſaid number be revers'd, the ſum will be 990, the third of which is 330, equal to half of 660.

Paradox.

THE ſum of nine figures a number will make,
From which if juſt fifty you're pleaſed to take,
One third of that number remains ſtill behind,
This number, young Tyro, be pleaſed to find.

Anſwer.

Reverse the figure ſix and it will become 9, and write the figure 3 in the ten's place, which will preſent 30—to which add the eight digits, their ſum will be 75, from which take 50, remains 25, being the third of 75.

Paradox.

Paradox.

JUST one pound ten (ſhillings) will name a man,
His ſign likewiſe, 'tis not the ſwan:
Come tell this landlord's name and ſign
That John may know to call and dine.

Anſwer.

THE man's name was Mark Noble, who lived at the ſign of the Angel.

Paradox.

A TRUSS of hay weighing but half a hundred weight in a ſcale, weighed two hundred weight ſtuck upon the end of a fork carried upon Hodge's ſhoulder: How could that be?

Anſwer.

THE fork was as the ſteelyard—Roger's ſhoulder as the fulcrum ſuſtaining the burthen between the two powers, acting at both ends of the fork.

Paradox.

HOW can a mechanic file a ſquare hole with a round file, and fill up an oval hole with a round ſtopper?

Anſwer.

A PIECE of pliable metal being doubled, by applying a round file to the double edge, and filing a half ſquare gap, on opening the metal, a ſquare will appear. Again, if two corners and an edge, at the end of a miſer's iron cheſt, be filed away with a round or any other file, there may be an exact ſquare hole left. And further, if a cylindrical body being cut obliquely, the plane of the ſection will be an oval; and conſequently a round body, ſituated obliquely in an oval hole will completely fill it.

Query.

YE lovely fair the truth declare,
Do bluſhes more diſpenſe
A mark within of conſcious ſin
Or ſpotleſs innocence.

Anſwer

Answer.

THE rosy cheek more frequently does shine
From innocence, than from a sense of crime.
The man who knows no honour, knows no shame;
And he that's lost to truth, is lost to fame.

A DELICACY peculiar to the fair, has often been observed to produce a blush, when impropriety so far prevails as to introduce an immodest subject; and it is no uncommon thing for a person to blush on being discovered in an error of any kind; and farther, diffident and very delicate people will blush when speaking to their superiors, &c. In either case a crime cannot be implied. On the other hand, observation convinces us that the hardened wretch, when before a dispenser of justice, and indubitably guilty of flagrant crimes, does not even change countenance. Hence a blush cannot be considered as an infallible criterion of either innocence or guilt, but much more frequently the former than the latter.

Query.

YE lovely fair who every heart engage,
Whose learn'd productions grace many a page,
Inform me, what is love?—that soft regard
Which you create, you only can reward.

Answer.

LOVE is a tender fondness, a strong desire,
An ardent wish, an unextinguished fire;
A longing soul, a chase imploring mind;
To share those charms we in another find.

PYTHAGORAS says, "Love breaketh the brain, but never "bruiseth the brow; consumeth the heart, but never touches "the skin; and maketh a deep wound to be felt before any scar "be seen."

An Arithmetical Paradox.

IN an Arabic manuscript was found this remarkable decision of a dispute. "Two Arabians sat down to dinner: "one had five loaves, the other three. A stranger passing by, "desired permission to eat with them; which they agreed to. "The stranger dined, laid down eight pieces of money and

"departed. The proprietor of the five loaves took up five "pieces, and left three for the other, who objected, and "inſiſted for one half. The cauſe came before Ali (the "magiſtrate,) who gave the following judgment: Let the "owner of the five loaves have ſeven pieces of money; and "the owner of the three loaves, one."—Query the juſtice of this ſentence.

Anſwer.

ALI's ſentence was juſt. For ſuppoſe the loaves to be divided each into three equal parts, making twenty-four parts in all the eight loaves, and each perſon to eat an equal or eighth part. Therefore the ſtranger had ſeven parts of the perſon who contributed five loaves, or fifteen parts, and only one of him who contributed only three loaves, which make nine parts.

Query.

TAKE a cup of cold water fill'd up to the brim,
Then one after t'other ſlip ten ſhillings in;
When this you've perform'd, I'd have you diſcover
What is the reaſon the cup won't run over.

Anſwer.

IT is a natural quality of all dry ſubſtances, to reſiſt water in a ſmall degree. Hence the top of the cup being ſuppoſed to be dry, the ſhillings, or any other ſmall thing being not ſo great as to overcome the reſiſtance, and ſlipped in with a ſteady hand, the water will riſe above the dry edge, without running over, till ſo many are put in, as to cauſe the weight of the heaped up part to overcome the repulſion of the dry edge.—The truth of this propoſition may be proved various ways, but by none more ſimple and eaſy, than by dipping your finger in the water and wetting the edge of the cup with it, upon which all the water which is above the rim of the cup will run over.

A Paradox.

MATHEMATICIANS affirm that, of all bodies contained under the ſame ſuperficies, a ſphere is the moſt capacious: But ſurely they have never conſidered the amazing capaciouſneſs of a body whoſe name is now required, and of which it may be

be truly affirmed, that ſuppoſing it's greateſt length nine inches, greateſt breadth four inches, and greateſt depth three inches, yet under theſe dimenſions it contains a ſolid foot.

Anſwer.

A SHOE.

Query.

WHICH is more free of cares and ſtrife,
A married or a ſingle life?

Anſwer.

CELIBACY, on the one hand, is free from the contentions of jarring couples: and on the other, utterly inſenſible, of thoſe endearing faculties, which are the frequent attendants on a happy pair.

'Tis without doubt a ſingle life;
Muſt be moſt free from cares and ſtrife.

Query.

MODESTY and baſhfulneſs are often ſpoken of indiſcriminately; what is their diſtinction?

Anſwer.

MODESTY is an emblem of chaſtity and humility, and is very becoming: it is decent without being forward, and can aſſume a modeſt aſſurance, without diffidence. Whereas baſhfulneſs is childiſh, and ruſtic, aukward and unbecoming; and is moſtly cauſed by fear, or diffidence, or the want of keeping company.

Query.

INGENIOUS nymphs, if e're you wiſh to ſhare
The joys connubial, and deſire to wear
The pledge of love, its origin declare:
Say from what motive firſt the cuſtom ſprung,
And why on the fourth finger always hung?

Anſwer.

THE cuſtom was introduced by the ancients, who uſed to preſent their miſtreſſes with a ring, meaning thereby to expreſs, as a ring has no end, ſo there ſhould be no end of that love

which is neceſſary to conſtitute connubial felicity. And it was put upon the fourth finger of the left hand, becauſe anatomiſts affirm that there is a vein in it having a direct conveyance to the heart, which is the ſource of love and affection.

Query.

WHAT ſyſtem of philoſophy gives the moſt convincing and demonſtrative proof of the immortality of man?

Anſwer.

It may be ſaid, without incurring the imputation of atheiſm, that no ſyſtem of philoſophy gives us either convincing or demonſtrative proofs of the immortality of man. Perhaps metaphyſics bid faireſt to anſwer the conditions of the query. —Inferences may be drawn from anatomy, and even from botany; but every argument drawn from philoſophy ſeems to be weak; and it is from inſpiration only that we have convincing proofs of the immortality of man.

Query.

THE origin of Valentines declare,
From what it ſprung, from whom, and when, and where.

Anſwer.

It is ſuppoſed that the origin of Valentines was from one Valentine a prieſt, who lived in the third century, and who upon his being diſappointed of a biſhopric, forſook the chriſtian faith. He publiſhed that there were thirty gods and goddeſſes, fifteen of each ſex, whom he called aones crages and, taught that our Saviour, like another Pandora, ſprung from their correſpondences, and farther affirmed that he paſſed through the Virgin Mary with a body he brought out of Heaven, as through a pipe or conduit, and that all men ſhould not riſe again. His followers who were unmarried, uſually met together on the 14th of February each year, and each choſe one of the oppoſite ſex, who were to inſtruct and adviſe each other on religious and other affairs, during the following year. —But ſome perſons are of opinion, that it had its origin from the obſervation of the birds, who chuſe their mates about this time of the year.

Query

Query.

REQUIRED an explanation of all the letters on a Guinea.

Anſwer.

THE inſcription on a Guinea runs thus:

GEORGIUS III DEI GRATIA, M. B. F. ET. H. REX, F. D. B, ET L D S R. I. A. T. ET E.

THAT is, Georgius Tertius, Dei Gratia, Magnæ Britanniæ, Franciæ et Hiberniæ Rex, Fidii Defenſor, Brunſwicii et Lunenburgi Dux, Sacri Romani Imperii Archi-Theſaurarius et Elector.

In Engliſh.

GEORGE the 3d by the Grace of God, King of Great Britain, France and Ireland, Defender of the Faith, Duke of Brunſwick and Lunenburgh, Arch. Treaſurer and Elector of the Holy Roman Empire.

Paradox.

I'M neither man, beaſt, fiſh, nor bird,
Inſect or reptile none;
Yet live and breathe, tho' (on my word)
My origin was bone.
As ſoon as you have found my name,
All doubt will diſappear;
Then fail not to reveal the ſame
Unto us without fear.

Anſwer.

The bone that's meant, if right I hit,
Has often try'd men's ſharpeſt wit;
Since, with woe from man's ſide it came,
Woman therefore is its name.

Paradox.

I WAS to-morrow, but am not to-day;
Yet ſhall be two days paſt: my name diſplay.

Anſwer.

YESTERDAY's paſt which once was call'd to-morrow;
This ſome perhaps do find unto their ſorrow.

Paradox.

FAM'D arboriſt diſplay your pow'r,
And ſhew how I may plant a bow'r
With verdant fir and yew:
Twelve trees of each I'd fain diſpoſe,
And only eight and twenty rows,
Four trees in each to view.

Anſwer.

FIRST make a circle, (Plate VI. fig. 3.) which divide into eight equal parts, and inſcribe two geometric ſquares, in each of which draw two diagonals; then draw the lines A B, A C, &c. from all the angles of both the ſquares; after which draw the parallels, as per figure, and it will anſwer the conditions of the problem.

Query.

BY what motive is a lady, who has ſeveral admirers, induced to place her affections on that man who is the leaſt anxious to obtain her favour; and diſregard him, the diſintereſtedneſs and ardency of whoſe paſſion is conſpicuous in every part of his conduct: when from the former, nothing but coldneſs and indifference, if not an averſion to her, is to be expected after the marriage-knot is tied: but from the latter the moſt affectionate, endearing and indulgent tenderneſs, on every emergency, to the lateſt period of life?

Anſwer.

A man who has a real eſteem for a lady approaches her with fear and diffidence, which appears in his whole behaviour: this, though the greateſt proof of real eſteem*, the lady, from a thoughtleſs gaiety, deſpiſes him; for, whilſt a man is indifferent about obliging a lady, he can behave with eaſe and gaiety (I might add with aſſurance) this being more adapted to the gay diſpoſition of a lady, ſhe is taken with it. The ladies are certainly more apt to be governed by their own airy inclinations, than by their better judgments.

* "Every paſſion, but fond love,
"Unto its own redreſs will move;
"But that alone the wretch inclines,
"To what prevents his own deſigns:

"Makes

" Makes him lament, and ſigh, and weep,
" Diſorder'd, tremble, fawn and creep;
" Tortures which render him deſpis'd,
" Where he endeavours to be priz'd."

Query.

WHY does the generality of mankind incline more to inebriety than ſobriety?

Anſwer.

ALL mankind, at ſome time or other, are involved in care and trouble; and as drinking plentifully is thought by many to be an antidote againſt it, man ſeizes, with too much eagerness, the much-loved habit, and frequently cuſtom draws him on more to inebriety than ſobriety.

Query.

WHY is every hang-man call'd Jack Ketch?

Anſwer.

PROBABLY from the dog Harpalus (in Engliſh catch or ketch as vulgarly written) mentioned by Ovid, and Jack a word of deriſion.

Query.

WHY may news be ſaid to be the true and genuine food of the mind?

Anſwer.

THAT every thing novel pleaſes the mind we allow, even though it is in itſelf tragical; variety is alſo found to be pleaſing. News is variety, and conſequently may be ſaid to be the genuine food of the ſoul.

Query.

WHICH is ſupremeſt in woe, a king without the love of his ſubjects, or, ſubjects without the love or favour of their king?

Anſwer.

WHEN that reciprocal love and affection is broken, which ought to ſubſiſt between the prince and people, it is, indeed, very

very difficult to point out which is in the worſt ſtate. The one is filled with fears and apprehenſions, and the other is full of doubt and anxiety. The prince who conſiders himſelf as the common father of his people, muſt undoubtedly wear a crown of thorns, if his ſubjects prove froward and diſobedient children, and therefore will ſtrive to hold their hearts in his boſom; but when that fatherly affection is loſt, what are the ſubjects but wretched orphans, void of the protection they had a right to expect? They wander up and down deſpairing and deſpiſed, without power of redreſs, or hope of enjoyment. Oh! wretched ſtate of both! But, oh, how bleſt the ſtate when kings are ſerved through love, unawed by fear. It is hard to ſay however, which is the ſevereſt ſtate, but I humbly imagine the ſubject muſt be the ſupremeſt in woe.

Query.

TELL me, ye ſons of freedom, what muſt be
The only thing to make us all agree.

Anſwer.

Ye ſons of freedom ſure muſt be,
The only thing to make us all agree.

Quere.

WHETHER is love or hatred moſt prejudicial?

Anſwer.

If taken in a ſcriptural ſenſe, hatred muſt certainly be moſt prejudicial; but taken politically, love may ſometimes be productive of more prejudice than hatred.

Query.

WHETHER is the miſer or the ſpendthrift the greateſt enemy to themſelves, and the moſt hurtful to public ſociety.

Anſwer.

The injury ſuſtained by a ſpendthrift is generally confined to a few individuals; but the miſer is ſuperlatively wretched, being a profeſſed enemy to God, his neighbour, and himſelf.

Parado

Paradox.

WHEN life and breath forſake a body, what doth that body ſtand in need of?

Anſwer.

BOTH life and breath when you was born,
Did from your mother go;
'Twas nouriſhment you needed then,
That you and I both know.

Paradox.

ONE day I ſaw the ſun ariſe,
I'm ſure I ſaw him ſet likewiſe;
But wonderful! that day,
I vouch again he roſe, and 'gain
Beneath the horiſon went: explain
How this could be, I pray.

Anſwer.

IN leap year, by ſtatute law,
The intercal'ry day,
And that preceding, reckon'd are
To be but one: I'll lay
A bet, this will the paradox
Sufficiently explain,
For the ſun, in ſuch a day doth riſe,
Set, riſe, and ſet again.

Paradox.

OUR neighbour Randle's loving wife,
Has brought him at one birth,
Three goats and ſix calves, all with life,
Strange wonder here on earth
Is come to paſs!—dear people ſay
How this could be—make no delay?

Anſwer.

WITHOUT ſtretch of wit,
I have readily hit,
For Goat ſure her name muſt diſplay;

If

If the children were three,
Six legs there muſt be,
Six calves to thoſe legs muſt convey.

Query.

AS water is a thin fluid, what is the reaſon that veſſels will contain it, that will not contain the thick ſyrup of ſugar treacle, &c?

Anſwer.

THE very ſmall particles of water by capillary attraction penetrating into the pores of the wood, and there expanding cloſely the chinks, they contain the water; but the thick ſyrup of treacle, ſugar, &c. not entering the pores of wood, conſequently does not cloſe the chinks. Therefore the veſſel will not contain them.

Query.

THERE are two letters in the alphabet which always go together and are never parted; which are they?

Anſwer.

WHO can miſs of the query, but ſolve it that tries,
When the letters Q U are ſo plain to their eyes.

Paradox.

YOU may ſay what you will, of a true boſom friend,
If ever it is in their power;
At the riſk of their lives they miſchief intend,
And are ſeeking it every hour.

Anſwer.

THE bleſſing how great when poſſeſſed of a friend,
Who for us his life will expoſe,
To baffle the ſchemes our en'mies intend,
And miſchief brings on to our foes.

Paradox.

THO' perhaps you'll deny it, it's true I aſſure you,
Moſt women are quieteſt when in a fury.

Anſwer.

Anſwer.

WHEN in a paſſion women fly,
And ſtrive to gain the victory;
If overcome revenge is ſought,
In female breaſts a dreadful thought!
Unto their chamber they repair,
Their looks their anger to declare,
In ſilence then they ſit and cry,
Till their revenge they ſatisfy.

Paradox.

A PARADOX I've made this morn,
My ſubject is quite new,
I dy'd before that I was born,
Gents, how can this be true?

Anſwer.

I puzzled was, but found this morn,
That Eve was made, but never born.

Query.

HOW many kings have been crowned in England ſince the Conqueſt?

Anſwer.

JAMES the firſt was made a muckle king,
Of Caledonia's ſhore;
The only king in England crown'd,
That was a king before.

Query.

WHY will the ſun be longer in burning white cloth, paper, &c. with a mirror, than any other colour?

Anſwer.

IT is becauſe white bodies have the property of reflecting all the rays of light, and therefore do not admit the ſun to have ſuch power on them, as on other colours; for other colours (black eſpecially) are known to abſorb the rays of light, and therefore the ſun has a greater power to deſtroy them.

Query.

Query.

HOW can number 45 be divided into four ſuch parts, that if to the firſt part you add two, from the ſecond part you ſubtract two, the third part you multiply by two, and the fourth part you divide by two, that the ſum of the addition, the remainder of the ſubtraction, the product of the multiplication, and the quotient of the diviſion be all equal?

Anſwer.

The firſt is	8	to which add 2, the ſum is	10
2d —	12	ſubtract 2, remainder is -	10
3d —	5	multiplied by 2, product is	10
4th —	20	divided by 2, quotient is	10
	45		

Query.

WHETHER is the man of bad morals and great reſolution, or, the worthy virtuous man, moſt fit to rule?

Anſwer.

Though the man of bad morals and great reſolution may poſſibly do ſome great and good actions, yet his ſphere of action being unlimited, it is probable he may do many vile and ſinful ones, and ſuch as may prove a ſnare to both the ruler and the ruled. On the contrary, the man whoſe actions are bounded by virtue, moves on ſteadily and uniformly; his actions are ſuch as bring honor to himſelf and happineſs to thoſe under him; the worthy virtuous man is therefore moſt fit to rule.

Query.

WHAT did money firſt purchaſe?

Anſwer.

The cave of Machpelah, for a burying place for Sarah, was the firſt purchaſe with money that hiſtory informs us of. See Geneſis, chap. 23.

Paradox.

DEAR people, my father did lay up for me,
On the day of my birth juſt pounds twenty-three;
On each birth day ſince for me has lain by,
Twenty-three pounds, or that ſum very nigh,
Until I arrive at the age twenty-one,
My fortune's ſo odd you'll ſcarce think upon;
When I tell you it comes to the ſum as below*
No more nor no leſs how it is pray ſhow.

Anſwer.

By what is propos'd, Sir, it plainly appears,
That your birth day arrives only once in four years.

Paradox.

I'M no algebraiſt, but this I do know,
That three eights put together make juſt twenty-two.

Anſwer.

Take three eights of the number † that's given below,
And the quotient you'll find to be juſt twenty-two.

Query.

WHAT is the reaſon that ladies of faſhion and quality, prefer winter (the moſt unpleaſant ſeaſon of the year) before ſummer, and why do they dread the approach of the la ter more than the former?

Anſwer.

The ſummer ſun I'm much afraid,
Doth ſpoil the beauty of the maid;
But winter's cold ſhe need not fear,
I think this makes the matter clear.

Query.

WILL a voluntary ſubmiſſion to temporal puniſhment make any atonement for the ſin?

* 138 Pounds.

† $58\frac{2}{3}$

Answer.

THE bare act of a voluntary submission to temporal punishment will not be alone sufficient to atone for the sin; sincere repentance through the atonement of Christ, being absolutely necessary for that great purpose.

Query.

WHAT is the cause of those places on fields and commons of a circular form, vulgarly called the rings of the fairies?

Answer.

THEY are generally supposed to proceed from lightening; the second circle arising from the grass growing more plentifully where the first grass was burnt up, &c.

Query.

AT what time of the year are most cavities open?

Answer.

As soon as harvest is cropt, is the time of the year
Most cavities are open, I'll make them appear:
And if I guess right, and right can remember,
It must be near the end of the month September.

Query.

"IS there not an appointed time to man upon earth?"

JOB.

Answer.

THE infinite power of the All-wise Creator has, and does undoubtedly fix an appointed time for every being of the divine species here on earth. Nothing can remain a secret to him, as the holy Job justly intimates, that there was an appointed time for him to suffer his afflictions, 'till called to the heavenly mansions of eternity.

Query.

WHY was the human, and other animal species, created with two ears and but one tongue?

Answer.

Answer.

THE human, and other animal ſpecies, were created with two ears, that various and oppoſite ſounds ſhould not loſe their ſtroke or effect. Whereas, if each animal had been furniſhed but with one ear, the ſounds propagated on the contrary ſide of the head would have failed in their effect. Dangers among all could not ſo well have been avoided, or other notice ſo diſtinctly conveyed; and muſic and converſation among the human kind had fallen ſhort of their preſent power to delight and inſtruct. One tongue is ſufficient to act in obedience to all the organs of ſenſation and reflection from the human ſpecies to the brute, and to aid the conveyance of the food of all animals into the ſtomach.

MANKIND may infer from their having two ears and but one tongue, that they ſhould hear more than they ſpeak.

Query.

MR. WOOLASTON ſays, in his Religion of Nature Delineated, that all perſons living beyond their circumſtances, at the expence of others, live a Lie: Who are thoſe, in every ſtate, that live, indulge, and thrive by more palpable impoſition?

Anſwer.

PERNICIOUS petty-foggers in a nation, who live by the plunder of mankind, in ſtirring up ſtrife, indulge and thrive by palpable impoſition. And thoſe who live beyond their circumſtances, running in debt to ſupport ambition and vanity, though they appear what they know they are not, and never deſign to pay, are yet as honeſt as the former.

Query.

ST. PAUL ſaith [1 Cor. xiii. 13.] "And now abideth "Faith, Hope, and Charity, even theſe three; but the greateſt "of theſe is Charity." Why is this laſt glorious principle ſo little exemplified among ſome of our Reverend teachers; and for what purpoſe muſt Reaſon, the gift of the Great Creator, be made ſubſervient to incomprehenſible faith?

Anſwer.

I TAKE Charity to ſignify love and benevolence, as well as almſgiving, which I hope are as much exemplified among our

regular Clergy, as among the laity. We are told by atteſted revelation, that the Great Creator (whoſe Word is Truth) has enjoined our faith to aſſent to things above our comprehenſion, with an intent that, where our reaſon fails, faith ſhould aſſiſt us in our duties to himſelf and man. For men may be ſtrictly moral towards each other by the uſe of reaſon, while they remain vicious in themſelves, by acknowledging no duty to their Maker. But faith lifts the mind to God, and influences the thoughts and paſſions to habits ſuitable for divine contemplation. Hope (a friend to all, and without which all men would be miſerable) is likewiſe increaſed by faith more than by reaſon or morality; ſo that our reaſon is thus uſefully and beneficially ſubſervient to faith, in what we ought to believe, with reſpect to God and Providence. Faith not grounded on reaſon, is ſuperſtition, which however, in many different modes, may be innocent and uſeful, while it ſerves to bind the will and the paſſions, and direct the mind to God.

Mr. John Cotton, reflecting on the greatneſs of the Creator, and his ſecrets of Providence, to the latter part of this query, ſpeaks of man's frailty and faith, as follows:

God's Acts which are to be—ſhall human fleſh deſcry?
Or ſhall proud duſt pretend his will to prophecy?
We may prognoſticate, as far as fancy roves,
The juſt in faith ſhall be bleſs'd, as the margin proves*.
All ſhall converted be into the faith of Chriſt†,
Free from Idolatry—ne'er mind the Popiſh prieſt‡.
Let us hold faſt our faith, Death when it will may come,
And whilſt our way is good, who minds the faith of Rome‖.

Query.

WHAT are the chemical ingredients in the compoſition of a modern mathematician; and how is the method of proceſs performed for his extraction?

Anſwer.

With the profoundeſt reſpect to the noble Science of Mathematics, and after ſo much unwearied diligence, we have ventured to lay before the public the *Grand Arcanum*, intereſting all nations, conſtituting a modern Mathematician! firſt having conſulted our own and foreign Univerſities, the Royal Society, the

* Zach. viii. 23. † Matt. xxiv. 14. ‡ Zech. xiii. 2. ‖ Rev. xviii. 2.

the Commiſſioners of the Longitude, the College of Phyſicians, the murderers of Dr. Halley's Tables, and all other venerable and academical ſocieties, foreign and domeſtic, who could give us the leaſt aſſiſtance in a work of ſuch vaſt importance as the following compoſition.

HALF a pound of earth lying two feet deep, perpendicular from the ſurface where the body of Sir Iſaac Newton is depoſited; two ſcruples of imperceptible atoms; twelve ounces of demonſtrations, three hundred important problems unſolved, and forty-one ſolved; four ounces of fluxions, five ounces of caput mortuum of common ſenſe, nine ounces of precipitated reaſon; of ſublimated cyphers, ſubquintupleated reciprocal ratios, ſpiderial, ſeclatrical curves, and hyperboliſms, each a ſcruple; pluſes, minuſes, multiples, radices, dividendas, equals, poſtulatas, datas, inveſtigatons, theorems, corollaries, and ſcholiums, each a drachm; crooked pattin-rings, a pair; ſix of Heath's logarithmic exponential equations, all Demoivre's, Muller's, and Simpſon's Diſputes, with his late whole doctrine and application of Fluxions; the ſeventy enormous aſtronomical tabular blunders, in the mathematical digeſts; a Lady's-Diary, and Palladium; Mother Whiſton's Chronology, and half an ounce of dry converſation; put theſe ingredients into a retort, fitted with a bolt-head, hermetically ſealed, and let them all calcine together, in a ſand-heat, for three days; when cool, break the bolt head, take out the powder, and ſtop it cloſe in a large long necked bottle, for uſe.

WITH half an ounce of this powder made into an ointment, with a quantum ſufficit of hog's-lard, rub well the intended artiſt's breaſt and ſtomach, and about his navel, before a fire made with chips of mathematical inſtruments. This done, let him walk ſeven times round the Royal Obſervatory, at Greenwich, in a ſpiral curve. Then fix him on his back, upon a moveable axis, in the middle of a tobacco-hogſhead, headed up, with its poles paſſing through the center of both ends. The circles of the ſphere being chalked out about him, and light admitted at circular holes, each half an inch radius, round the ecliptic and equinoctial, he muſt roll down Greenwich-Hill, by the force of gravity to comprehend the earth's motion, and aberration of light. Being come to the bottom of the hill, the hogſhead muſt be ſtaved, and the artiſt ſet at liberty. Then he muſt take of ſilence, ſelf-conceit, and ſtiffneſs, each half a ſcruple, made into a bolus with the electuary

of technical terms, waſhing it down with a pretty large draught of ill manners.

THUS, he will inſtantly become a famous Mathematician, fit to be made profeſſor of Geometry, Aſtronomy, Algebra, Fluxions, Gunnery, and Fortification: likewiſe fit to be admitted an Uranographical Surveyor, Stock-jobber in Change-Alley, Star gazer, Almanack-maker, or Secretary to a Regius Profeſſor.

Query.

WHAT is the ratio of the length of time paſt, to that which is to come? And the ratio of each to the leaſt and greateſt time of a man's life of 100 years?

Anſwer.

ON a boundleſs line, contrarily extended, repreſenting each eternity, from the preſent point of time, there can be no diſtance of time paſt greater than that which is to come; nor any diſtance of time to come, greater than that which is paſt; whence the ratio of time paſt, to that which is to come will always be of equality: And the limited time of things repreſented by the intermediate diſtances betwixt the two oppoſite boundleſs extremes, will be nothing in reſpect to eternity, paſt, or to come.

HENCE, the leaſt time of a man's life to the greateſt of 100 years, will admit of no ratio in reſpect of eternity, or no other than $\frac{1}{\infty}$ and $\frac{\infty}{1}$ to an infinite quantity; but with reſpect to the intermediate diſtance of 100 years duration of life, the leaſt diſtance of time to the greateſt, on that ſcale, will be as 1 to an infinite quantity.

WITH reſpect to the limited life of beings, their times are in proportion as their different ſucceſſions of perception: for time, more or leſs, perceived by all beings, depends on the life of ſome being to perceive ſucceſſion of perception; without which perception time could not be; ſince abſolute imperception implies abſolute non-exiſtence.

To inanimates there is no time, while time or ſucceſſion of perception, appears to every being of ſenſe that can perceive ſucceſſion, or change of place; though we are ignorant of the different degrees of perception, cogitation, and foreſight, with which the Great Creator has endowed different ſpecies of created beings.

THE

THE quantity of duration perceived by each being is according to the ſwiftneſs or ſlowneſs of its ſucceſſions perceived, (*i. e.* according to the number of ſucceſſive perceptions) whereby a ſuperior Being, having as many ſucceſſions in a day, as any man has during his whole life, may be ſaid to live that man's life in a day. And hence men of quick parts and penetration may be ſaid to live more than men of dull faculties, in the ſame time. And by the ſame rule, the life-time of a man is indifinitely greater than the life of a reptile, &c.

DWELLING on a ſubject of entertainment, by which the attention is diverted from obſerving ſucceſſion, makes time appear ſhorter than it really is; as does forgetfulneſs of what is paſt. On the other hand, by every moment of ſucceſſion counted, when we endure pain, time then appears longer than it is; ſo that an age of pleaſure is not ſo long as a few years of pain, with reſpect to the beings that enjoy and ſuffer them.

THE Eternal Now, ſo called by ſome authors, as the property of the Divine Perception, is as incomprehenſible as time without beginning, or as the attribute aſſigned the Divine Being, of doing any thing, when it is evident he cannot deſtroy himſelf, nor yet the ſucceſſion of time. If time was to be no more, according to the cuſtomary phraſe, no thinking being could then exiſt, nor time be perceived. Moreover, if God perceives all that ever was, or will be, in one vaſt idea, as preſent, yet we cannot truly affirm, that he actually ſaw Chriſt upon earth till he came; and therefore he muſt ſee by ſucceſſion through the whole courſe of nature, though infinitely ſuperior to the ways of human perception.

Query.

WHETHER it would not be vaſtly ſerviceable to this kingdom in general, to have public regiſters of debts erected in every county, as well as in Middleſex, and one part of Yorkſhire? And whether courts for the recovery of ſmall debts ſhould not likewiſe become general, as well as in London and Middleſex, to prevent the impoſition of tricking petty-foggers, bailiffs, and their followers.

Anſwer.

PUBLIC regiſters of debts, in every county, would prevent fraud and extravagance, and inculcate the principles of honeſty and good œconomy amongſt us; as well as put an end

to

to the pernicious practice of double and treble mortgages on the same lands; and guard against lending money on bad security.

INCUMBRANCES upon most considerable estates in this kingdom being already known, the discovery thereof can be no objection to the passing an act for registering debts in every county, as it would promote the welfare and tranquillity of the nation; while other political courts of Europe are endeavouring to reduce the number of their lawyers, and retrench their exorbitant fees.

IF courts for the recovery of small debts were general, they would be of universal advantage by their easy expence, speedy issue, and security of the plaintiff's money not being paid into the hands of such (vermin of the law, and enemies to justice and mankind) as commonly withhold the best part of it.

Query.

HOW is the scripture doctrine of smiting one cheek, and turning the other, and giving your cloak to him who takes your coat, to be reconciled with the conduct of the Right Reverend and Reverend Teachers of the age, so tenacious of their own property, and ready to resent injuries? And why should not precept be preferred to example?

Answer.

THIS doctrine of smiting one cheek, and turning the other also, was probably first taught in the infancy of christianity, to propagate the Gospel, and the principles of patience and forbearance, among individuals; at a time when converts were few, and when resentment would have heightened their punishment from their powerful persecutors: for it never was a doctrine betwixt different nations, repelling force by force. And to reconcile this doctrine with the general conduct of the christian part of the same nations at this day, seems to be as difficult as it would be to prevail with respective individuals, or those under different governments, to unite in the same form of worship. If what Mr. Dryden observes be true,

The Priests of all Religions are the same,

We shall find that the teachers are more revengeful, and refractory than their hearers. An instance of which appears in the

the news from Paris of the 5th of January 1750-51. N. 8. A few days ago an extraordinary council was held at Verſailles, on the affairs of the clergy, many of whom ſhew a perverſe ſpirit, and inſiſt upon principles and ſacred immunities, and talk as though they were ordained to draw the wealth of the nation to themſelves, and contribute nothing towards its expence. This is a ſpecimen of the ſubmiſſive behaviour of the Catholic prieſthood, who, in this point, I confeſs, outdo thoſe of our country. For, though no perſons living are more tenacious of their own private property than the Proteſtant clergy, yet, they never ſcruple to pay their proportion of taxes to the public. And however harſh this text may found in an age of rapine and plunder, where property ſeems ſo precarious, the doctrine before us, of ſmiting one cheek, and turning the other alſo, was certainly well calculated for the peace and welfare of ſociety in government; and to prevent petty quarrels, and religious controverſies about trifles.

And where example is ſo rare, the precept ſhould be preferred as far as it will bear.

Query.

WHICH of theſe tradeſmen, a Bookſeller, Print-ſeller, Printer, Copper Plate Printer, or Publiſher, have the moſt honeſty?

Anſwer.

Though the employments of Letter-Printer, Bookſeller, Publiſher, Plate-Printer, and Print-ſeller differ, yet they are members of the ſame body, and conſequently are poſſeſſed in ſome degree of the ſame principles, ſubject to the ſame temptations, and tainted with the ſame crimes. By comparing their reſpective artifices, the reader will the better judge of the truth and juſtice of our deciſion, with reſpect to their ſeveral integrities.

The Letter-Printer, originally, had an undoubted title to the free exerciſe of all the five branches of buſineſs, but as the number of hands encreaſed, and trade grew more extenſive, they came to be divided into their preſent different claſſes. The Letter-Printer was reduced to a ſtate of dependency, whoſe ſituation with the Bookſeller, is like the Bailiffs with the Petty-fogger. They muſt keep their maſter's ſecrets, be acceſſary to their frauds, and ſubmit to their will and pleaſure, or elſe ſtarve.

Self-intereſt,

Self-intereſt, as well as ſelf-preſervation, is implanted in our natures, and if one will not do dirty work for gain, another will.

THE Plate-Printer has two maſters to ſerve, the Bookſeller and Printſeller, who can hardly be ſuppoſed to ſerve both with integrity. We might as well expect he ſhould be able to ſerve God and Mammon at the ſame time.

THE Bookſeller and Printſeller are the grand corruptors, who communicate the infection through the whole tribe. Theſe are wilfully fraudulent; whereas the others are only by compulſion.

THE Bookſeller preys upon Authors, as the Printſeller does upon Engravers, whom they purſue as the Dolphins do the Flying-Fiſh, either inſtantly to devour, or to drive them aloft, that they may drop into their mouths. For, if any Author refuſes the price offered him for his copy, he is ſure to have his work run down by the whole ſociety. If, to ſecure his property, he hazards the printing and publiſhing his own performance, the ſale of it is prevented; for ſuch book being ſent for out of the country, all orders are returned ignoramus, and a jury ſummoned thereupon to ſuppreſs it. They pretend to a vaſt fund of learning, but on enquiry, you will find it all ſuperficial, conſiſting in Title Pages. And they generally keep ſome poor pedant under their thumb, through whoſe eyes they ſee, and by whoſe judgment they are determined.

THE Printers are the tools they work their wonders withal, without which they can perform nothing. Into theſe they early inculcate the doctrine laid down in the parable of the unjuſt ſteward, and for every hundred ſheets they work off, bid them ſit down quickly and write fifty: then commend their integrity, and ſay they have done wiſely. In ſhort, it is hard to find ſuch a ruling thing as conſcience among the fraternity. All moral duties muſt truckle under to intereſt; nor will they make any ſcruple of invading the property of a ſtranger, of a neighbour, or even their own brethren.

THE Publiſher is a ſort of Bookſeller in miniature, but guilty of far greater extortion. He neither advances any money, nor runs the leaſt hazard, and yet is hardly ſatisfied with 30l. per cent. per month, for vending another's property. Upon the whole, as we are not able to diſcover the leaſt tincture of any one virtue in above one out of twenty Bookſellers, Printſellers, Letter-Printers, Plate-Printers, and Publiſhers,

liſhers, the ſmall ſhare of common honeſty to be found in more than that number, we aſſign it to the Letter-Printer.

N. B. The foregoing is not intended to reflect upon any of the worthy gentlemen in trade, whom we know to be men of integrity.

Query.

WHETHER Britiſh authors, in general, ſhould not ſeek out Foreign patrons, to accept their Dedications, ſeeing their endeavours to promote uſeful knowledge meet with no encouragement at home?

Anſwer.

As prudence directs every artificer to ſend his manufacture to the beſt market, I think no author ſhould heſitate a moment about dedicating his labours to any foreign Mæcenas (whether commoner, peer, prince, or potentate) from whom he has reaſon to expect the moſt encouragement, or reward; whether he reſides in Europe, Aſia, Africa, or America.

In the 188th Spectator, it is obſerved, "That nothing can occur more monſtrous than to ſee perſons of ingenuity addreſs their ſervices and performances to men no way addicted to liberal arts: in which caſes the praiſe on one hand, and the patronage on the other, are equally the objects of ridicule. Dedications to ignorant men are as abſurd as any of the ſpeeches of Bulfinch in the Droll: ſuch an addreſs one is apt to tranſlate into other words; and when the different parties are thoroughly conſidered, the panegyric generally implies no more than if the author ſhould ſay to the patron; My very good lord, you and I can never underſtand one another, therefore I humbly deſire we may be intimate friends for the future.

The rich may as well aſk to borrow of the poor, as the man of virtue and merit hope for addition to his character from any but ſuch as himſelf. He that commends another engages ſo much of his own reputation, as he gives to that perſon commended; and he that has nothing laudable in himſelf is not in ability to be ſuch a ſurety. The wiſe Phocion was ſo ſenſible how dangerous it was to be touched with what the multitude approved, that, upon a general acclamation made when he was making an oration, he turned to an intelligent friend that ſtood near him, and aſk'd, in a ſurpriſed manner, "What ſlip have I made?"

Query.

Query.

WOULD not the licenſing of public brothel-houſes in Britain, as well as in other chriſtian countries, be of advantage to the public, and prevent diſeaſes, rapes, robberies, murders, and the ruin of many families? And whether it would hurt the Proteſtant religion more than the Catholic?

Anſwer.

PUBLIC ſtews permitted in this nation, would doubtleſs be of ſervice to the government, by the revenue ariſing therefrom, and would be a means of bringing more ſubjects into life, and of preventing the diſmal effects of many lewd pernicious practices. And, though they might be looked upon as novel ſchemes for the encouragement of debauchery, and deſtructive of the Proteſtant religion, (becauſe not habitual as among the Catholics) yet if conſidered under their train of advantages, ſuperior to the diſadvantages attending their toleration, they are preferable to the preſent practices, by as much as regulated vice or paſſion is ſuperior to a ſtate of abandoned out-rage; farther conſidering that human infirmities don't admit of a perfect cure.

Query.

AS in a married ſtate a man is obliged by the law to lay in priſon for debts contracted by his wife, without his knowledge and conſent, is it not fit he ſhould have power to impriſon her for his own ſecurity, being not able to raiſe money on a jointure, but by her own conſent? And how is matrimony in this caſe conſiſtent with reaſon and equity?

Anſwer.

IT might be thought incredible for any woman to ſuffer her huſband to ſtarve in priſon, and her children to live in a ſtate of ſervility, when it is in her power to prevent both, had we not daily inſtances of ſuch barbarity. And when the wife is the aggreſſor, and the huſband blameleſs, as it ſometimes happens, the barbarity is ſtill more ſhocking; and wherein our laws are greatly defective in not providing a remedy. And a man's confinement in priſon can anſwer no other end than to gratify the ſpleen or revenge of his creditors, who are ſometimes his ſeducers, in hopes of gaining profit by his ruin.

Reaſon

Reaſon and equity call aloud for a reſtraint upon the wife in caſes of jointure, and running her huſband in debt. The marriage-inſtitution is not herein blameable; but the evils attending marriage ſettlements, made previous to the marriage itſelf.

WHENEVER an unreaſonable jointure is made on a moderate eſtate, and three or four children happen to be provided for, experience ſhews, that ſuch lands are commonly alienated in the ſecond generation. And I have often wondered that no better expedient could be found out for paying inſolvents debts than by loſs of liberty.

Query.

WHAT would have been the religion of the late Archbiſhop Tillotſon, if he had been born and lived a few years at Pekin in China, and the reſt of his days at Conſtantinople in Europe? And which has the beſt title to ſalvation, the Jew, Mahometan, Pagan, Papiſt, Methodiſt, Muggletonian, Lutheran, Calviniſt, Quaker, Preſbyterian, Independent, Anabaptiſt, or the followers of the pious Mr. Henly?

Anſwer.

HAD the great prelate, ſpoken of, been born at Pekin in China, and continued there during his minority, doubtleſs he would have imbibed the Pagan principles: for the prejudice of education being ſo ſtrong, made the Heathen poet obſerve,

Quo ſemel eſt imbota recens ſervabit odorem
Teſta diu.———

After which, Mahomet would have worked no more effect upon him in Turkey, than if he had gone from England to reſide there, at the ſame age for the reſt of his life.

As no religion can entitle a man to ſalvation but by the right uſe of it, men may miſcarry by all religions, and therein one religion not have preference to another; as ſome cannot be happy living under any government. But if we compare religions to governments, by which they are ſupported for ends of happineſs, we ſhall find that the reformed chriſtian religion is as preferable to other religions, as the chriſtian government ſupporting it, is preferable to all others. As to Mr. Orator Henly's piety, it is equivalent to that of his conſtant hearers; of a piece with his modeſty and truth.

Query.

IF to Apollo's ſmiles you've juſt pretence,
And claim from him your boaſted influence,
O tell a doubtful and enquiring fair,
The reaſon why her ſex ſo open are?
Why ſecrets in their breaſts no ſafety find?
And why their vows are fleeting as the wind?

Anſwer.

YOUR outward beauties inward thoughts betray,
As men thro' curtains ſee the breaking day;
But ſure, you ſometimes keep the vows you make,
And men accuſe you by a groſs miſtake.
Your faults are doubled by your being fair,
White cloth ſhews ſpots much larger than they are
And flaws moſt deep, in brighteſt gems appear.

Query.

WHY are the blacks in Guinea woolly-headed, and with flat noſes, when they are not ſo in other places?

Anſwer.

FIRST, in anſwer to that, why the blacks in Guinea are woolly-headed? It is fit to obſerve, that by the help of the microſcope, it has been found that hair and wool differ only in bigneſs, being otherwiſe made up quite after the ſame manner, and every ſingle hair conſiſting of ſeveral other ſmaller, wrapped up as it were in bark, and that the number of theſe minute hairs in wool is leſs than it is in what we properly call hair. It remains then only to find out ſome reaſon why the hair of blacks does conſiſt of a leſs number of theſe minute hairs than that of other nations, and it may very well be ſuppoſed that this difference proceeds from the ſmallneſs of the pores of the ſkin, out of which they are bred and receive their encreaſe.

SECOND, as to the flatneſs of their noſes, if they come ſo into the world, it may eaſily be accounted for, by the likeneſs we ſee generally, children bear to their parents. But I ſhould rather be induced to believe, that it being reckoned a piece of beauty amongſt them, they artificially form themſelves into that ſhape, and that may eaſily be done in new born infants, ſince

ſince what we call the bridge of the noſe is then only of a cartilaginous or ſoft griſtly ſubſtance.

Query.

YOU merry ſons of god Apollo,
Who this reſponding buſ'neſs follow,
And can reſolve in ſuch a trice,
Our queſtions difficult and nice;
Pray tell me what you do opine
Of that ſame ſprite, or thing divine,
Which did in danger often give,
Old Socrates a tug by the ſleeve?
And why the dæmon did not twitch,
When he eſpous'd that bitter b—h?

Anſwer.

INGENIOUS Sir, we muſt confeſs,
We like your humour and addreſs;
Therefore without deſign to flatter,
We'll tell you what we think o'th'matter.
That dæmon, ſprite, or what you pleaſe,
Which was ſo kind to Socrates,
Was wiſdom, and right reaſon join'd,
Which gave ſound dictates to his mind.
Theſe only fail'd him when he choſe
That fiend Zantippe for his ſpouſe,
Which ſhews if matches are the care
Of Heaven, the ſage no fiend had there.

Query.

SUPPOSING I have a challenge ſent me to fight, and I am unwilling to do it, ſince it is againſt the laws of God and man. How ſhall I behave myſelf ſo as to ſave my honour?

Anſwer.

ANTIQUITY preſents us with a memorable paſſage concerning two ſoldiers in Cæſar's army, who upon a very hot contention, agreed upon this expedient to decide the quarrel, namely, vigorouſly to attack the common enemy, and vindicate their own by their country's honour. The reſolution taken, one of them aſſaulted the thickeſt ſquadrons, and had like to have ſaved his reputation at the expence of his liberty: but

the other reviewing the danger of his antagoniſt, flew after him with a generous emulation, bravely reſcued him from his ſurrounding foes, and gloriouſly overthrew him by a prevention of his overthrow. Apollo is a ſtrange admirer of ſuch genuine bravery, and therefore preſſingly recommends ſo noble an experiment.

Query.

SINCE you are mathematical, and reſolve caſes belonging to chance, you will oblige me to let me know whether there is any odds in playing at even or odd, if there is any, it ſeems very odd to me?

Anſwer.

THOUGH you ſeem merrily diſpoſed, and to have ſent this queſtion for the ſake of a pun, yet there is more in it than perhaps you imagine, for the greateſt number of pieces that you can graſp, is either an even number or an odd one; if it is an even number, then in this number, and all the numbers inferior to it, there is as many even numbers as odd ones, and therefore it is equal which is taken; if the greateſt number of pieces you can graſp is odd, then there is advantage in gueſſing odd; for in an odd number, and the inferiors to it, there is one odd number more than there are even ones; and therefore, upon the whole, there is an advantage in taking odd preferably to even. We do not know whether this reaſon can convince you, but whether it does or no, we may aſſure you (to return pun for pun) that it is even ſo.

Query.

WHY is it, that ſo very few are qualified with juſt and ſublime notions of friendſhip?

Anſwer.

WE conceive the chief reaſon to be, the corruption of our manners; the generality of people, living a life of ſenſe, and not of reaſon, of which friendſhip is the offſpring.

Query.

OFF-SPRING of Phœbus, ſons of Delian ſire,
For ſo we judge you by your parts and fire,

Tell

Tell us, why thoſe, the vulgar call the wiſe,
Do wit, and witty men, ſo much deſpiſe?

Anſwer.

THE man of wit, and not of judgment too,
Is juſtly ſlighted by the wiſer few;
But when both join and in one center fall,
That man, like thee, commands reſpect from all.

Query.

WHY are ſome perſons ſo chill, even to ſhaking, as in an ague, after eating? Your ſolution will oblige your humble ſervant, Iris.

Anſwer.

THE digeſtive faculty of the ſtomach attracts ſo much heat to it for concoction of the food, that the reſt of the body for a while is left without a ſufficient quantity to invigorate the tendons, &c. to perform their offices; but is a ſign of healthful conſtitution.

Query.

LEARNED Apollo tell me why
So little wool, ſo great a cry?

Anſwer.

A QUESTION taken in anſwer's ſtead,
Why ſuch ſmall brains, ſo great a head?

Query.

WHY does caſtration hinder the voice breaking; and if maturity alters the voice at ſuch an age, why ſhould it not have the ſame influence upon women?

Anſwer.

THE breaking of the voice is cauſed by the heat of the body, which dilates the aſpera arteria, or wind-pipe: now caſtration diminiſheth the heat of the body, and conſequently prevents ſuch an alteration; and the conſtitution of the female ſex being naturally colder than that of men, preſerves their voices ſhrill and tunable.

Query.

TELL me ye learned offspring of Apollo,
Why after riches avarice does follow,
When the poſſeſſor ought by reaſon juſt,
With wiſdom to employ ſo great a truſt.

Anſwer.

WEALTH with magnetic force attracts the mind,
To ſordid earth ungerouſly conſign'd.
Thence in proportion to its larger ſtore,
We need not wonder, if it draws the more;
But tho' this loadſtone fix the iron ſoul,
The golden genius mounts without controul.

Query.

I DESIRE your opinion of that paſſage in the Common-Prayer, (viz.) "Give peace in our time, O Lord! Becauſe there is none other that fighteth for us, but only thou, O God!" For why ſhould we deſire peace when He fights for us, and we own his omnipotence?

Anſwer.

SINCE a true and ſolid peace ought to be the aim of all our fightings, and is the proſperous iſſue of a ſucceſsful war, to whom ſhould we addreſs ourſelves for ſo important a bleſſing, but to that God who fights our battles, and upon whom alone we can depend for ſo glorious a concluſion of them?

Query.

IN what ſenſe are theſe words to be expounded in 1 Pet. 4. 6. "For this cauſe the goſpel was preached alſo to them that are dead?"

Anſwer.

THE perſons here deſigned were Gentiles, to whom the goſpel was preached as well as to the Jews. And from the 1ſt chapter to the Romans we may clearly ſee, that the Gentiles were dead in a ſpiritual ſenſe, dead in treſpaſſes and ſins.

Query.

Query.

WHY, when any thing is burnt to, is it said the bishop's foot has been in it?

Answer.

We presume it is a proverb that took its original from those unhappy times, when every thing that went wrong, was thought to have been spoiled by the bishops.

Conundrums.

1. WHAT is placed before gentlemen's houses, with what grows in their gardens.
2. What pleases when in the air, and what a horse cannot abide?
3. Half a carman and a whole country.
4. The gift of Heaven and the motion attending it.
5. The half of a private entertainment, and a part of a goose.
6. What Goliah carried to battle, and the head of the nation.
7. An animal common in Wales, and what is very common in England after marriage

Answer.

Wallflower, larkspur, and likewise a carnation,
Snowdrop, and jonquil, for five gives explanation;
Kingspear, and monks' cap are next two no doubt,
The last one is goat-rue, and now the secret's out.

Query.

——————PRAY which wou'd you chuse?
A wit without beauty, or a beauty without wit,
When each is endorsed with a deal of conceit?

Answer.

Were I from these to chuse a mate,
The wit I'd love, the beauty hate:
For in the witty head is sense
Which ever will chace folly thence:
But beauty, with conceited brain,
In folly ever will remain.

Query.

Query.

WHICH deſerves the greateſt puniſhment; the ſoul or the body, for the committing of ſin? and which is the moſt guilty?

Anſwer.

THE ſoul of man is a particle of the deity; and when firſt infuſed into the body was ſo perfect, had ſuch lively characters of the deity impreſſed upon it, as were ſufficient to enable it to repel the tempter, maintain its integrity, and obey the injunctions of its great original; which the body could not do, being only its receptacle, a place of reſidence for the ſoul to act in, and taken from the duſt: Conſequently the ſoul is more culpable, and juſtly merits a greater degree of puniſhment than the body.

Query.

WHETHER do thoſe monopolizers, who contrary to law buy up corn, &c. with an intent to ſell it at an advanced price, or thoſe, who encouraged by law buy up the ſame for exportation, contribute the moſt towards diſtreſſing the poor, by raiſing the price of proviſions?

Anſwer.

BOTH parties, it is certain, diſtreſs the poor greatly; and it is hard to ſay which does it the moſt. Now the monopolizers oft make a ſcarcity in the midſt of plenty, tis true; yet they help the poor to corn, though at an extravagant price: whereas when it is exported, it can yield no relief to the poor at any rate, being quite gone: Wherefore I think theſe laſt diſtreſs the poor moſt; for certainly it is better to have corn at any advanced price, than to have none at any rate.

Query.

WHENCE did the cuſtom firſt arrive,
Of ringing bees unto their hive?

Anſwer.

THIS cuſtom, proceeded at firſt from obſerving that inſtinct in theſe ſagacious inſects to return to their hives, when they are out at labour, at the approach of a ſtorm: the air at that

time undergoing a very ſenſible change in its denſeneſs, they are undoubtedly apprehenſive of the approaching danger, and immediately repair to their caſtle of ſecurity. The tinkling of a mortar has ſomewhat a ſimilar effect on them, as it in ſome meaſure condenſes the circumambient air, ſo far as the ſound extends: but the fugitives then having no place of retreat, being driven from their hive by the old ſwarms, are obliged to ſeek ſecurity on whatever they find any way convenient for them.

Query.

WHO firſt found out the Hot-Wells at Bath? and how long ſince?

Anſwer.

THE firſt diſcovery of the hot-wells appears to be of a very ancient date. In the king's bath at Bath, is a ſtatue of king Bladud, (whom Mr. Cambden calls the ſoothſayer) with an inſcription under it, importing that he diſcovered the uſe of theſe baths three hundred years before Chriſt.

Paradox.

IT was at my houſe, but the other day,
The following kindred a viſit did pay:
Two grandfathers; two grandmothers,
They were the firſt that came;
Next four ſiſters, and two mothers
(Tho' ſome were blind and lame)
Two huſbands, and two fathers next,
That happened to come there,
Two wives, and then two mothers came,
But did not cloſe the rear;
Two uncles, two aunts, with th'reſt came to dine,
Four daughters, two ſons, to taſte of my wine;
Two grand-daughters came along with the reſt,
Two nieces, two couſins, dreſs'd up in their beſt:
This catalogue of kindred mentioned here
Are only ſix; and all from inceſt clear.
How their kin is grounded I would have you ſhow,
And you'll a favour great on me beſtow.

Anſwer.

Answer.

THE father and his ſon, married the mother and her daughter. The father married the daughter; the ſon married the mother; and they had each of them a girl.

Query.

WHETHER poverty impeacheth or ſtaineth nobility?

Answer.

RICHES are an ornament, not the cauſe of nobility; and many times we ſee more worth under a thread-bare cloak, and within a thatched cottage, than the richeſt robe and ſtateliest palace.

Query.

WHAT paſſion is the moſt that can
Prevailing be o'er mortal man?

Answer.

SINCE, whatever way a man's mind is bent, it is influenced by love, with reſpect either to good or evil; love is always the rule of the reſt of the paſſions. Hence,

The moſt prevailing paſſion that I know,
Is love, the ſource of all our joy or woe!

Query.

IF a man ſhould throw himſelf from the top of a high tower, doth he fall to the ground by attraction, compreſſion, or gravitation?

Answer.

WHATEVER is projected from the earth, if the body that projects reſts upon the earth, the motion of the earth is communicated to it. Hence, the man's fall is by gravity in particular; and by compreſſion, gravity, and attraction in conjunction.

Paradox.

A MAN that was young at threeſcore and ten,
He gave it me in, and wrote it down then,

His

His friend was more old at twenty and two,
(You may think it falſe; but 'tis certainly true;)
Ingenious wits, this ſecret now unfold,
For old died young, and young he died old.

Anſwer.

THE young was nam'd old, and the old was nam'd young,
So a paradox from that odd circumſtance ſprung.

Query.

WHAT is content?

Anſwer.

CONTENT is that ſtate of the mind, when it is not only free from all anxiety and uneaſineſs; but poſſeſſes a ſerenity, and even a pleaſure in itſelf, which proceeds from a conſciouſneſs of the rectitude and uprightneſs of its intentions: For I dare venture to affirm, that no man with bad intentions ever at that time experienced real content. On the contrary, while a man knows that he does to the utmoſt of his power and capacity, acknowledge his preſent and future dependance on his Creator, and endeavours at the good of all about him, he cannot be far from a contented mind. At leaſt, this muſt be allowed to be the beſt method to procure one.

Query.

WHAT is ridicule? and from whence does it ſpring?

Anſwer.

RIDICULE, in matters of literature, is that ſpecies of writing which excites contempt with laughter. Whence, in the examination of ſuch kinds of writing, the mind naturally calls upon it to aid argument and reaſon; when its impreſſions on the imagination are conſiſtent with the nature of things: but when it ſtrikes the fancy and affections with fictitious images, it becomes the inſtrument of deceit. But however ridicule may impreſs the idea of apparent turpitude, or falſehood, in the imagination, yet ſtill reaſon remains the ſupreme judge or touch ſtone of truth.

Query.

Query.

WHO firſt ty'd the gordian knot?
Can you tell—or can you not?
And for what reaſon?—let me know
And you'll oblige a friend at Stow.

Anſwer.

GORDION knot, a knot which one Gordius, a Phrygian, who being raiſed from the plough to the throne, hanging up his plough and furniture in the temple, tied up in ſo very intricate a manner, that the monarchy of the world was promiſed to him that untied it; which Alexander the great, after ſeveral eſſays, not undoing, cut with his ſword. Whence the reaſon is evident, that the perſon who had ſkill and penetration ſufficient to untie it, ſhould be deemed (after performed) capable to rule and govern the whole earth, from his great underſtanding and judgment, if any ſuch could be found out.

Query.

WHO are they that deſpiſe what they moſt do admire?
Dear gentlemen, tell me,—no more I require.

Anſwer.

SINCE it is ſo, that you are deſirous to know
Who deſpiſe what they moſt do admire;
Be it known to your ſex, who delight to perplex,
When you've ſet our affections on fire:
For if you can't gain us, you then will diſdain us;
And rail at us all that you can:
Like the fox by the grapes, are thoſe leaders of apes,
Who rave when they can't get a man!

Query.

YE witty bards, indulge a youth,
To know the under written truth;
In doing which, you'll give relief:
Pray, how do tears aſſuage one's grief?

Anſwer.

THE definition of grief is trouble, ſorrow, and vexation of heart; and that of tears, a drop of water diſtilled from the

head

head, and paſſing through the eye, &c. Now when and where grief happens, it ſeizes upon and affects the animal ſpirits, which are fluid, and belong to the brain. Therefore ſometimes, when grief happens, it falls with ſuch an heavy preſſure upon the animal ſpirits, as does not admit of, or produce any agitation therein; then the apparent ſymptoms are nothing but an heavy groaning, or deep ſighing, as of one in ſore affliction, or miſery. But when grief comes with an effervency, ſo as to produce an agitation, and thereby a fermentation, of the animal ſpirits, it affects ſome one or more of the animal functions, (which Dr. Quinſey, in his Lexicon Phyſico-Medium, ſays, the learned Boerhaave defines to be twelve;) which cauſes an ebullition, whereby the tears are diſtilled, and flow from the head through the eyes, as it were the ſpirits dropping from the beak of an alembick; and thereby may be ſaid to give eaſe in, or aſſuage grief. A ſudden ſurpriſe of joy ſometimes may cauſe, and be the production of tears, and thereby prevent a ſyncope, which ſometimes happens; but in that caſe it cannot be ſaid to be an eaſing of grief, &c.

Query.

WHAT methods are moſt proper for the ladies to adopt, to induce the men to enter into marriage?

Anſwer.

THE only method is to be virtuous, good natured and not too forward: to make the moſt of prudent affability, free from the leaſt degree of affectation.

Query.

WHETHER the marriage act has done good or harm to the ſtate?

Anſwer.

THE reſtraint under which ſome muſt neceſſarily be laid by this act of parliament, may ſeem little burdenſome to their minds; but as the great good of a nation depends principally upon the number of its inhabitants; and as experience daily proves, that there is no power can bind the profligate and licentious in a proper degree; it is plain that more hurt than good has followed from it.

Query.

WHY does dress and adulation attract the fair sex more than known plainness and sincerity?

Answer.

DRESS certainly has a great effect upon female minds, who are too apt to be pleased with externals. But why it should be more attractive than honest plainness and sincerity, I know not, (though it is a daily experienced truth) unless we account for it by the force the different senses have on different objects. For we often see two ladies who shall be pleased and displeased with the same object at the same time; and that object at a distance, I mean a man.

Query.

WHO are they that despise what they are known most to admire?

Answer.

PRUDES, who affect to hate like the fox in the fable what is out of their reach.

Query.

WHY are some sorts of diversions, though extremely laborious, esteemed pleasure more than business?

Answer.

BUSINESS was a task impos'd on man;
Freedom, alone, was his unbounded plan;
Pleasure would be painful—his nature such,
And ease a trouble—if he had too much.

Query.

WHICH is soonest reconciled to his misfortune, a miser that has lost his gold, or a lover who has lost his flame?

Answer.

A DESPAIRING lover is a very wretched being, but yet there may be some hopes he'll return to himself. Other objects may entice or friends advise. But the miser who makes gold his

his god, and having loſt it, gives up all comfort, periſhes like him, who the apoſtle ſays, dies without hope.

Paradox.

DEAR Sirs, pray believe me, I'll make it appear
That the ſum of two numbers their difference are.

Anſwer.

Born *latitude and longitude†,*
When on either ſide they lie,
Will anſwer well the paradox,
I'm ſure you can't deny.

Paradox.

B, and C, own brothers be,
Own brothers to their mother D;
And uncle to each other are;
Own couſins too 'tis very clear.
Their pedigrees, I pray make out,
Ingenious wits, and clear each doubt.

Anſwer.

Ben-ammi and Moab, the ſons of old Lot,
He (when ſenſeleſs with wine) on his daughters begot;
Are the brothers, whoſe pedigree traced—no doubt
Will infallibly make the affinity out.

Query.

IT is ſaid Britain was diſcovered to be an Iſland about the year 90. Who was the diſcoverer pray?

Anſwer.

As to the name of Britain, there is no certainty of its original in hiſtory; that which paſſed for current in former times, when moſt nations pretended to be of Trojan race, was, that Brutus, the ſon of Silvius, grand-child of Æneas the third king of the Trojans, having after a long voyage, and many wanderings, fell upon this Iſland, and conquered the race of Giants; and having given it the name of Britain, left the ſovereignty to his poſterity.

*Different side of the equinoctial.

† Different side of the first meridian.

Query.

WHY do immodeſt Lawyers wear
Habits of clergy? make appear.

Anſwer.

THERE is no reaſon why Lawyers wear the habit or uniform of Clergy, except from cuſtom; or that the former (which indeed is moſt likely) are adminiſtrators of juſtice, the latter of truth: and I think, might be termed brotherhood.

Query.

WHY is the language of a ſcold
Moſt moving, Sirs? I pray unfold.
And for what reaſon? tell me then,
No more I aſk, Sirs, from your pen.

Anſwer.

THE reaſon why the language of a ſcold is moſt moving is, becauſe no man that is in his ſenſes will ſtay to hear it.

Query.

WHAT is the cauſe of certain luminaries, if a cat is ſtroked in the dark?

Anſwer.

THE ſkin of a cat which nouriſheth the hair, is impregnated with an oily ſubſtance, with friction, or rubbing in the dark, there ſeems fiery ſparkles to proceed therefrom, &c.

Query.

KIND gentlemen, pray clear this doubt,
And tell the man who firſt found out
The *Antipodes*; and in what year?
Ingenious wits, this point pray clear.

Anſwer.

IN the year 571 before Chriſt, Pythagoras of Samos diſcovered the Antipodes; he was the firſt among the antients who aſſumed the name of philoſopher, (by way of modeſty) as condemning the pride and arrogance of others, who would be called wiſe men.

Paradox.

Paradox.

TO plant a grove I would diſpoſe
Of fifteen trees in fifteen rows;
So that each row may three contain,
And now the method pray explain.

Anſwer.

THUS as you ſee, (Plate 6. fig. 4) you may diſpoſe
Of fifteen trees in fifteen rows;
And, in each row are three contained,
(Adepts) the method I've explained.

Query.

WHAT is the true reaſon, philoſophical, mathematical, or natural, why an egg, with its end placed horizontally againſt the palms of the hands, cannot be broken with the greateſt human preſſure?

Anſwer.

THE reaſon proceeds partly from all three cauſes mentioned in the query. 1. The air within it, not only ſupports the ambient air, but alſo the two abutted elliptical domes.—2. Thoſe elliptical domes bear a preſſure equal to arches (every way) on this conſtruction, which cannot be forced together, ſo long as the materials laſt;—therefore 3dly. The hands being of a ſofter texture than theſe materials cannot break it.

Query.

WHAT were crowns originally? and who may be ſaid to have wore the firſt gold one?

Anſwer.

CROWNS are deſigned to be an ornament, &c. and as ſuch, I find they were originally uſed; as may be ſeen Exodus 25. 5. 11. where a golden crown was to ornament the Ark, &c. and verſe 25, the ſame ornament for the table, &c. (and per query) "And who may be ſaid to have wore the firſt gold one" If we compare the 30th. verſe of the 29th. chap. of Exodus, with the 6th. verſe of the 29th. chap. it will appear that Aaron was the firſt that wore a gold crown, &c.

Query.

WHY do haddocks, as well as ſome other freſh fiſh, when hung up in dark places, appear to reflect a ſtrong light?

Anſwer.

SOME are of opinion that the cauſe of light ſought in this query, proceeds from the quantity of phlogiſton contained in this as well as other kinds of phoſphoric. And others ſuppoſe that all bodies no ſooner partake of death, but they inſtantly (in ſome meaſure) fall under the ſtate of putrefaction (though at firſt unperceivable to our ſight, taſte, or ſmell) this cauſes, in a little time a violent fermentation; and all bodies under this ſtate, containing lucid particles, will by that means be diſcernable in the dark.

Paradox.

NAY prithee ſay no more, I'll plainly prove,
'Tis happineſs to be in debt, or love.

Anſwer.

IN love, or in debt, both, or either to be,
Is happineſs always to Ben;
For when I can't pay, I away to the ſea,
And enjoy both my pipe and my can.

Query.

OF all human inventions, Which may be ſaid to be moſt ſerviceable to mankind?

Anſwer.

OF all human inventions I hope you'll allow
There's none of more ſervice to man than the plough.

Query.

WHO is the happy man?

Anſwer.

THE man who keeps the golden mean,
And calmly ſteers his bark between

The

The rocks of hope, and gulphs of fear,
Makes piety his only care,
And whose pure life and conscience saith
He shall be happy after death.

Paradox.

I ATTEST it for truth,
A mistress that's kind,
Be she ever so ugly,
I beautiful find.

Answer.

AMORENSIS, 'tis true, three long years I've been blind,
Not the least glimpse of light can I see;
Tho' ugly my mistress appears to your mind,
When kind she is handsome to me.

Paradox.

'TIS true I protest with an absolute breath,
That what is called life, is natural death.

Answer.

WHEN we receive our breath
We enter upon death;
'Tis therefore plain, that we each moment die;
For life and death go hand in hand; and why?
Death tho' the foe of life, with us was born;
Tho' life so often makes of death a scorn.

Paradox.

HOW is it, to you I appeal, (my friend Ranger)
That the pleasantest life's to be always in danger?

Answer.

WHEN danger's expected,
And still is neglected
What pleasure attends on the thought!
The good and the brave
Despise death and the grave,
Tho', certain—so you and I ought.

Dangers

Dangers seen from afar,
Or in ſickneſs or war,
But enliven the flame of the ſoul;
Virtue cries with delight
'Tis noble to fight,
And pleaſant theſe foes to controul.
Had virtue no foes
No not one to oppoſe,
No paſſions to conquer below,
Like a fool that ſtands ſtill,
Without reaſon or will,
We could not ſubſiſt here you know.

Paradox.

EVERY true wife
—(Indeed 'tis true)
Is falſe; and I can prove it too.

Anſwer.

How a wife can be falſe and at ſame time be true,
Paradoxical really muſt be;
They ſometimes approve of what ſometimes they rue,
And are falſe to themſelves and not thee.

Paradox.

I HAVE read (and pray tell me, Sirs, how it can be)
To impriſon a debtor is to ſet him free.

Anſwer.

If t'impriſon a debtor, Sir, ſets him quite free;
From bailiffs and duns, ſure the meaning muſt be.

Parador.

PRAY tell me what that man intends
Who aſſerts that our enemies are our beſt friends?

Anſwer.

Our enemies a mirror be,
By which our ſmalleſt faults we ſee,
Friends, ſeldom ſo ſincere will be.

Paradox.

Paradox.

LET who will love for me,
I ne'er will fight a duel,
No not for any ſhe,
The kindeſt's moſt cruel.

Anſwer.

THE harlots in the ſtreet,
Moſt lovingly appear;
If ſome you chance to meet,
A cruel devil's there.

Paradox.

A SCHOLAR boaſting of his ſkill,
Was met one day by country Will—
Determin'd now to poze the clown,
Aſk'd him how far to yonder town,
If in a right line now it ſtood,
'Twixt him and yon adjacent wood.
The ruſtic thinking how't cou'd be,
Thought in himſelf I'll puzzle thee;
And ſaid I little underſtand,
But hope you'll anſwer out of hand:
Say two from one can you ſubtract,
And three remain to be exact?
The ſcholar now no more could ſay,
But walked off, and bid good day,
Hoping ſome friend will anſwer find,
To clear the vapours of his mind.

Anſwer.

A WOMAN delivered of two children.

Paradox.

SOME ſay ſuch a thing as a cuckold has been,
I deny it.—A cuckold has never been ſeen.

Anſwer.

SOME ſay men are born,
To be cuckolds and horn'd
But one I yet never could ſee:

Therefore

Therefore why ſhould I,
Believe by the bye,
That ſuch a thing ever can be.

Query.

WHAT are the chemical ingredients in the compoſition of a modern phyſician? And what is the method of proceſs for his extraction?

Anſwer.

A GOOD likely young fellow, valet de chambre to ſome gentleman who has travelled abroad; make him member of a druggiſts and apothecaries club in London, where let him endeavour to get by heart the names of the principal drugs, medicines, diſeaſes, and technical terms.

WHEN he is well verſed in the exercife of the ſaid terms and has got the Greek Alphabet by heart, with twelve ſelect lines of the Schola Salernitana (to avoid breaking Priſcian's head) he muſt ſuffer himſelf to be ſuſpended naked in an Hippocrates's ſleeve, filled with Elixir ſalutis up to his chin, which being filtrated, and only himſelf and the faeces left, he muſt repeat, without heſitation, all the ſaid names and technical terms, the whole ſociety ſhall think proper, and alſo the Greek Alphabet before he is ſuffered to come out: and for every Greek letter, or technical term he miſſes perfectly pronouncing, he ſhall receive a ſmart lick through the flannel on his poſteriors, with a large long liquorice ſtick, and be obliged to repeat the ſame till he ſays his leſſon perfect, to the ſatisfaction of the audience.

THEN he and the faeces muſt be ſuddenly tumbled out together (by cutting open the bottom of the bag) upon a blanket, held underneath by four luſty druggiſts or apothecaries, who are to toſs him, together with the faeces, till he begins to grow ſick. Then, let him be wrapt up in dry flannel, put into the ſhell of a coffin, (cautioning him againſt dealing death) and carried to Haddock's Bagnio, near Charing Croſs, to be there ſweated, and his ſkin well mundified; where he may, if he pleaſes, ſleep for that night. This done, he muſt be dreſſed, and carried from thence in a chair to Monmouth-ſtreet, and Middle row, Holborn, to be equipped with a ſecond-hand ſuit of black, a tye wig, large ſnuff-box, and ſhort ſmall ſword. Thence he is to be carried (by the ſame conveyance)

conveyance) to Batſon's and the chairmen to receive his left off cloaths for their fare.

A DIPLOMA being next procured him from Edinburgh, Glaſgow, or Leyden, he is to attend on the ſaid ſociety of druggiſts and apothecaries, at their next meeting, and deliver the ſame, kneeling on a cuſhion, upon the table, to their preſident for the time being; who, after reading it aloud, dubs him doctor, by waving a gold-headed cane three times over his head, and then delivers it into his hands for a preſent. At which time all the members ſtanding up, una voce, muſt cry out, Long live the noble Eſculapius! and the preſident repeat, by whom the moſt obſtinate and inveterate diſorders, whether acute or chronical, ſhall quit their latent receſſes, tremble at his ſagacious nod, and fly before his awful fiat——Proceed to proſper——feel the ladies pulſes, dive into family-ſecrets, inſinuate your infallibility, augment your preſcriptions, evacuate our ſhops, and rarify the people.

——— opiferque per orbem
Dicor.———

N. B. THE fees to be paid down on this admiſſion are twenty guineas to the ſociety, beſides the whole expence of that meeting, in an elegant ſupper and treat; for which the doctor ſhall be allowed to viſit at each of the member's ſhops gratis, and aſk as many queſtions about the names and nature of drugs, and medicines, as he chuſes—and have ocular demonſtration of the ſame—Likewiſe ſhall have liberty to feel Mamma's or Miſs's pulſe, to bring his hand among the ladies, for ſo ſmall a preſent as a diamond ring—and thereby making himſelf acquainted with the female anatomy and diſorders, he may ſoon after commence man-midwife if he pleaſes.

Query.

GOD ſaid, "Let there be light, and there was light," before the ſun was created; whether then light is not a fluid ſubſtance, diffuſed through ſpace, and other fluid ſubſtance, totally different from the ſubſtance of the ſun, requiring the preſence of his fiery rays to make it conſpicuous? In like manner, as light is conſpicuous by the preſence of the fiery rays of a candle, illuſtrating air or ſpace in the ſun's abſence? And how are the ſun's fiery rays (emitting heat and colour to ſenſation) which are continually exhauſted in immenſe quantities,

quantities, from that fountain of fire, naturally ſupplied? Alſo, whether colours are real, or only apparent accidents, in reſpect of ſenſation; it being not certainly known, whether the animals diſcern colours and objects alike, or in all reſpects as they appear to human reception?

Anſwer.

If all the light were in the ſun,
Then in his abſence would be none,
But yet we find, that flame by night,
As well as he, produces light.
Before the ſun, if light was made,
The light from him can't be convey'd.
The fiery particles are ſuch,
As rouſe the fluids by a touch:
So lovers touches cauſe ſurpriſe,
And make the virgin's bluſhes riſe!
Attraction and repulſion join'd,
In the ſame body we do find;
The ſun attracts from every ſphere,
As he repels, when acting near:
Exhauſts his vigour and reſtores,
Like a young rover in amours.
So beauty with a ſmile invites,
But with a ſudden frown affrights.
Apparent colours ſtrike the eye,
More than our ſenſe reality.
To diff'rent ſenſes objects ſuit,
As well in man as in the brute.
Theſe are ſuggeſtions from my quill,
Referr'd to critic Anſer's ſkill.

Query.

WHAT is chance in nature, and what deſign? And how is the preſent exiſtence of things governed in reſpect of both thoſe diſtinctions?

Anſwer.

Design is a faculty of the human mind, by which, according to intellectual foreſight and volition, things are executed hereafter; whereas chance or accident are things occurring without any previous perception of the ſame. And

things

things are governed in both theſe reſpects by infinite cauſes, of which man comprehends but few.

Query.

AN acting cauſe implying a co-exiſtence of effect, the Creator having no beginning, how could there be a beginning to creation, or a time when things were not, or not as they are now? ſeeing, that a neceſſary general exiſtence of all things, ab origine, under the various mutations of forms, is as comprehenſible as a firſt neceſſary abſolute exiſtence, endowed with powers, and qualities to create a ſucceſſive order of exiſtence, in the infinite ſpace? And, that being all whatſoever (diſtinguiſhed by abſolute ſpirit, ſpirit and matter, or mere matter) is comprehended in the living and lifeleſs forms of ſubſtance, variouſly modified and ſupported in ſpace; and alſo, that original ſpace and ſubſtance, exiſting neceſſarily, ab æterno, being, to conception, as utterly incapable of annihilation, as abſolute ſpace, and the models of preſent ſubſtantial forms, perceived exiſting: the laſt appearing only ſubject to mutation, with the ſame quantity of ſubſtance in ſpace, always exiſting. And how does living exiſtence appear neceſſary at all, or that any being ſhould exiſt more neceſſarily than, or before, another.

N. B. SUBSTANCE is a general ſignification for material or immaterial forms.

Anſwer.

THE Creator, from the beginning, might create particular worlds and beings, nearly co-exiſtent with himſelf, and yet not create our preſent ſyſtems of things till after a certain period, during whoſe eternal exiſtence a ſucceſſion of new worlds and beings might decline, and again receive exiſtence, alternately, according to the nature of ſucceſſion obſerved in plants and animals, &c. The Sceptic's argument, that a general wiſe exiſtence of all things might, of itſelf, as neceſſarily be ab origine, as an original Infinite Creator, of himſelf, ab origine, to produce them, is thus anſwered, and confuted.—Taking with us our conſcious perception, we find that all things act, and are produced by a ſeries of cauſes, which therefore refer backward to ſome firſt original, which is God. 3. There is neither abſolute ſpace, abſolute ſpirit, abſolute matter, nor abſolute any thing, ſince the original cauſe, to which all effects, and their cauſes, produced, muſt refer, is of itſelf the only abſolute

ſolute exiſtence, filling immenſity, and ſupporting all being: ſo that it is an abſolute impropriety to mention annihilation of abſolute ſpace, and abſolute forms of living and lifeleſs ſubſtance. For, though we ſee forms, compoſed of matter ſubject to continual mutation; yet it is not certain that the ſame quantity of matter always exiſts, ſince the particular ſubſtance, of which matter is conſtituted, may be varied by the Creator, ſo as to be infinitely reduced, or extended in its capacity.—4. Seeing all things that can poſſibly be, muſt be, if any exiſtence, can be perceived at all (as it is evident we do perceive) living exiſtence will thereby appear neceſſary; and as one being may exiſt before, or after another, ſome beings muſt neceſſarily exiſt before, or after another.

Query.

WHAT is the difference betwixt religion and morality?

Anſwer.

RELIGION conſiſts in faith, and the obſervance of certain ceremonies, or modes of worſhipping a ſuperiour Being, to inculcate acts of morality. Whereas, morality itſelf, is independent of all religious forms; and, abſtracted from all faith, is productive of human happineſs, by its united and univerſal principles of benevolence to ſociety. Hence it appears, that morality is as the ſun, conſpicuous to all, and religion as a lantern to give light in its abſence.

Query.

WHAT is the beſt method for preventing the frequent robberies in and about London, and throughout the kingdom?

Anſwer.

THE firſt and beſt method to prevent frequent robberies in and about London, would be by mending the morals of the common people. In order to which they muſt be diſarmed of gaming, and the pernicious uſe of drams, whereby the morals and health of a people are made corrupt. For there is nothing ſo baſe or inhuman, that a proſtitute to drams, diſtracted in mind and reaſon, would ſcruple to commit.

IDLENESS and gaming are two endeared companions, and the grand ſeducers to madneſs and ſtupidity, ſpreading wider and wider. And by the preſent practices in vogue, (the miſ-

treſ

treſs teaching the ſervant-maid, the maſter the footman, and the preacher the people, by precious example) it is difficult to find a diſcreet acquaintance uncorrupted with cards and drams:—For they are all gone aſtray, and there is none that doeth good, no not one.

DRAM-DRINKING, like the p—x, enervates, corrupts, and deſtroys the ſtamina of the human race; as gaming deſtroys every great and good quality of the mind; rendering the nobility of a nation inferior to the beggars they are placed over to govern.

DRAMS, like opiates, or a miſer's comfort, aſſuage pain, for the preſent; but, in the end, produce gouts, and torments of mind inſupportable!

DRAMS and gaming aboliſhed, the next ſtep to ridding the nation of thieves and robbers, would be by encouraging innocent and virtuous amuſements; and alſo finding proper employment for the lazy, idle, and neceſſitous.

Query.

WHY ſhould any under the ſame government ſtigmatize others for their country, or place of nativity? And why ſhould the name of Iriſhman, or Scotchman, be more odious than that of Engliſhman?

Anſwer.

NATIONAL reflections proceed from want of national morals, for diſtinguiſhing the honeſt man, who, according to Mr. Pope, "is the nobleſt work of God,"—Let him come from what corner of the earth he will.

Query.

WHICH way, and how, might good be expected from a general naturalization?

Anſwer.

THE good that might be expected from a general naturalization is from the encreaſe of uſeful ſubjects, and conſequently of induſtry, trade and commerce; (Mr. Addiſon obſerving that each ſubject's life is worth ſo much per day to his ſovereign) for the lazy could hardly be expected to ſtir from home for advantage, who already have too much neglected their own

intereſt. Pretended friends might hereby find opportunity of becoming ſnakes in our boſom.

Query.

HOW many ſubjects poſſeſſed of ten thouſand pounds per annum, in land and houſes, have we in England, Scotland, and Ireland, reſpectively?

Anſwer.

A GREAT caſuiſt in national affairs, known for expatiating on his own infallibility, affirms, that there are exactly ten ſubjects, and no more, in England, Scotland, and Ireland, poſſeſſed of ten thouſand pounds a year clear of all incumbrances; and farther affirms, that there are ten times ten that number reputed to be worth as much, or a great deal more.

Query.

WHETHER aſſurance and impudence are not often imputed to merit, and ſtrength of ſpirits?

Anſwer.

ASSURANCE and impudence are conſidered by ſome as the ſame quality, though they differ as eſſentially as knowledge and ignorance.

Query.

HOW is an offenſive adverſary in converſation, beſt anſwered?

Anſwer.

AN offenſive adverſary in converſation is beſt anſwered in terms of reſpect and friendſhip; as taking pleaſure at all he ſays, is the only means to prevent flame, and extinguiſh fire. Sometimes leaving his company may be the beſt way to anſwer him.

Query.

WHETHER the reaſon commands the ruling paſſion, or the ruling paſſion the reaſon? And whether the will exerts itſelf as an ally, or deſpotic ruler, in reſpect of either?

Anſwer.

Anſwer.

REASON commands the ruling paſſion no other ways than as a judge and admoniſher. As far as the ruling paſſion and reaſon co-operate to one end, our will is determined to act: but we find the ruling paſſion ſo often deſpotic and powerful in reſpect of the reaſon, that it biaſſes the will to act againſt it.

THE ruling paſſion not only ſeduces the reaſon to compliance with the will; but pleads excuſes for the urgency of its tyranny over us.

Or from a judge turn pleader to perſuade,
The choice we make, or juſtify it made.
Pope's Eſſay on Man.

As appear from the vices and follies more conſpicuous than true probity in the actions of mankind.

MEN daily acting againſt their experience and conviction, have no remedy but from help implored of the Divine Being; which ſhews the neceſſity and good of religion to mankind.

THE will, by which men act, in their ſeveral ſtations, right or wrong, in reſpect of their preſent and future connexion with God and their fellow-beings, is neither a firm ally, nor deſpotic ruler; but a paſſive proſtitute to both, though commonly a volunteer in the ſervice of the latter.

THE paſſions conſtituting the various modifications of the eſſentials of living beings, are thoſe ſecret and dreadful ſources from whence the moſt remarkable actions and events recorded in hiſtory proceed.

Two principles in human nature reign,
Self-love to urge, and reaſon to reſtrain;
Nor this a good, nor that a bad we call,
Each works its end, to move or govern all;
And to their proper operation ſtill,
Aſcribe all good to their improper ill.
Self love, the ſpring of motion, acts the ſoul,
Reaſon's comparing balance rules the whole:
Man but for that, no action could attend,
And, but for this, were active to no end.
Pope's Eſſay on Man.

FOR a further account of the reaſon and Paſſions; read *Ethic.* Epiſtle II. throughout from this quotation.

Query.

WHO was he that firſt gave the name of Pope to the Biſhop of Rome, and no one elſe?

Anſwer.

GREGORY the ſeventh was the firſt that commanded the name of Pope ſhould peculiarly belong to the Biſhop of Rome, and no one elſe.

Paradox.

THIS is a truth (tho' the number's even)
The half of twelve's exactly ſeven?

Anſwer.

THE half of twelve will ſeven be,
Cut thro' the middle, as you ſee.*

Query.

A LAW at Tarentum, as ſtrict as Pope's bull,
Forbids importation of ſilks and of wool;
A merchant, and one for the law who had voted,
Five hundred fat ſheep in his next ſhip imported.
Sir Gravity Quiddity, where is the flaw,
Is the fault in the merchant, or elſe in the law?

Anſwer.

MY good Mr. Squa,
The fault's in the law.
The merchant's a knave,
If the truth you will have,
Or he ne'er had thus ſneer'd,
(When the ſheep he had ſhear'd,)
At the laws which were made
For the advantage of trade.

Query.

WHETHER is the bed moſt ador'd by the ſluggard, a full tankard by the drunkard, or money by the uſurer?

Anſwer.

* VII
AII

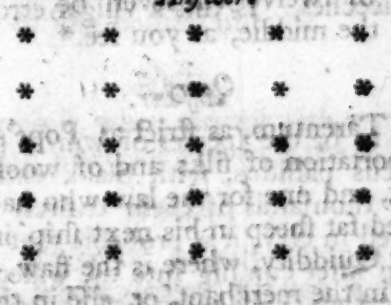
Anſwer.

THE uſurer his money he moſt doth adore;
He hoards up his pelf, and he ſtarveth the poor;
Whilſt the ſluggard will riſe and a penny will give,
The drunkard will ſpend it and let the poor live;
So I think that the uſurer is the worſt of all three:
I have paſs'd my opinion;—if ſo we agree.

Paradox.

INGENIOUS artiſts how may I diſpoſe,
Of five and twenty trees in juſt twelve rows,
That every row five lofty trees may grace,
Explain the ſcheme, the trees compleatly place.

Anſwer.



ACCEPT this method if you pleaſe,
And like the drawing, plant your trees:
They'll form a pleaſant cool retreat,
And ſhade you from the ſummer's heat;
As you ſometimes may to them go
When tir'd with buſtle, noiſe and ſhow.

Query.

IT is obſerved that the kidney bean and convolvulus, with ſome other plants follow the ſun's motion in their growth, or twine round a pole from eaſt to weſt; whilſt on the other hand hops and honeyſuckles, with many others, turn the contrary way. Can this difference be accounted for?

Anſwer.

THIS difference is one of thoſe operations of nature, which doubtleſs will never be accounted for; though probably effected

fected by attraction and repulſion; but in what manner?—We obſerve that the ſun-flower generally keeps turning its bloſſom towards the ſun; we behold with admiration the phænomena of the ſenſitive plant, and venus-fly-trap, but when we would enquire the cauſe, our reaſon is at a ſtand, and we are left to lament the circumſcribed ſtate of human knowledge.

Query.

I HAVE often obſerved certain animals exactly reſembling horſe hairs, ſwimming to and fro in ſmall rivulets; now the country people in many places, affirm, that they are the hairs of a horſe's tail, animated by lying a conſiderable time in the water; and that this has long been the current report, appears from a paſſage in one of the Marvell's poems, where he deſcribes horſes kicking at their tails, which had by a flood been transformed to leeches. Is this a vulgar error? if ſo, what are thoſe animals?

Anſwer.

THESE ſeem to be the ſpecies of worms called by Linnæus, Gordius aquaticus pallidus, with black extremities, though I have ſeen ſome thouſands of them entirely black; but as he ſays they are bred in clay, it is probable that they change to a pale colour ſoon after coming into the water. Merrett, in his Penax Britannicarum, calls them ſeta aquaticus, and mentions the ſame thing of their being vulgarly taken for animated horſe-hairs: his words are, "Vulgo creditur oriri, ex ſetis caudæ equinæ aquis immerſa." He has not taken notice of their colour.

Query.

WHAT is the difference between "to looſe" and "to "unlooſe?

Anſwer.

SOUND the ſ in unlooſe ſoftly (as in looſe morals) and the myſtery will vaniſh: ſo then unlooſe morals will be good morals, and unlooſe will ſignify to be tyed.

Query.

WHAT is the reaſon that dead bodies ſooner rot in a dry than a moiſt church-yard?

Anſwer.

Answer.

A BODY will keep longer in moiſt ground than in dry, becauſe in the former caſe the air is more excluded than in the latter.

Query.

ARE not children naturally ambidextrous?

Anſwer.

I BELIEVE experience teaches us that when children begin to make uſe of their hands, both are uſed indifferently, which perhaps would be the caſe when grown, did they remain in a ſtate of nature.—The preference given to the right-hand was certainly owing to cuſtom, for it does not ſeem to depend on the predominancy of any natural impulſe.

Query.

WHY does an object, when viewed with a magnifying lens, ſeem farther off than when viewed with the naked eye?

Anſwer.

IT has been a matter of diſpute among optical writers, whether an object when viewed through a magnifying lens appears farther off, or nearer, than with the naked eye; but the following experiments, I think, will clear up the point.

1. BRING a ſmall object nearer the eye than the limits of diſtinct viſion, then if a lens of a ſufficient magnifying power be properly placed between the eye and object, it will be ſeen diſtinctly;—here it is evident that it ſeems further off now viewed through the lens, for before we thought, and which was true in fact, that it was too near.

2. TAKE the tube of a common refracting teleſcope, or any other tube in one end of which is fixed a magnifying lens, through this look at the inſide of the tube and it will appear wider and longer according to the magnifying power of the lens: And the reaſon is this,—every object ſeen diſtinctly through the lens is magnified in length as well as breadth, and therefore a ſmall object placed in the tube muſt ſeem further off than it would at the ſame diſtance if we viewed with the naked eye, conſequently, in any caſe, if we conſider the ſpace between the glaſs and object as a tube, this experiment ſufficiently

ficiently determines the matter in queſtion. Hence it follows, that the parts of an object when ſeen through a magnifying lens, cannot appear, with reſpect to each other, in their natural ſituation.

Query.

WHAT is the reaſon that a body moving forward upon rollers, moves twice as faſt as the rollers themſelves?

Anſwer.

WHEN a body moves upon rollers the diameters of the rollers become as perpetual radii to the body moved, and the motion of the body is as thoſe radii; but the motion of the rollers is as their perpetual radii, therefore as the former radii are double of the latter, the motion produced from them muſt be ſo too.

Query.

WHAT are we to underſtand by the two daughters of the horſe-leach, which cry, "give, give? Prov. xxx. 15.

Anſwer.

ACCORDING to father Calmet, the horſe-leech in this place ſignifies luſt, its two daughters are avarice and ambition which are never ſatisfied. The ſeptuagint ſay three daughters inſtead of two. Bochart is of opinion that the Hebrew word Halukah which the ſeptuagint and vulgate, tranſlate horſe-leech, ſignifies deſtiny; and the two daughters of this deſtiny are hell and the grave, which never ſay, it is enough.

Query.

IS there any practical method that will actually prevent the growth of human hair, or, totally eradicate that already grown?

Anſwer.

IT is not eaſy to give a ſatisfactory anſwer to this Query; ſome mention the blood of a bat having been uſed and recommended as a preventative; and ſeveral receipts may be found in Wecker, Porta, and others.

Que

Query.

WHETHER have laws been upon the whole favourable or detrimental to the propagation of the human ſpecies?

Anſwer.

If all laws were at once to be abrogated, the conſequence would be, that each perſon would be content with as much land as he could cultivate; and having no artificial wants to ſatiate, nor luxurious appetites to gratify, a much ſmaller quantity of ground would be ſufficient for him than at preſent, and therefore there would be much more room for the multiplication of the ſpecies: beſides, man being naturally a more humane and induſtrious animal, would have much ſtronger motives to labour for himſelf than to take from another; and there would then be none of thoſe inhuman and extenſive wars which now depopulate whole countries, and are infinitely more deſtructive than any little trifling private murders, that might chance to happen if there were no laws, which murders, &c. never could be more numerous than thoſe which happen at preſent, in defiance of all prohibitions to the contrary; and which indeed muſt happen, as they are the unavoidable conſequences of the laws themſelves: moreover, it is allowed by the greateſt and moſt ſtrenuous advocates for legal government, that the poor (which are incomparably the moſt numerous) have very little benefit from the laws in general; and therefore it may be affirmed, if not with certainty, at leaſt with great probability, that laws have upon the whole been detrimental to the increaſe of the human ſpecies.

Query.

WHETHER is an impudent, or an hypocritical rogue the moſt deteſtable?

Anſwer.

Appearance is not always reality; if the laws in general be good, the hypocritical rogue can have no claim to merit for paying only an apparent reſpect to them, at the time he really infringes them; if they be bad, he has the additional villainy of giving his ſanction to what is evil; beſides uſing them as a ſtalking horſe to render his knavery more ſucceſsful. In other reſpects

reſpects the two rogues are equal, and therefore upon the whole, the hypocrite is the moſt to be deteſted.

Query.

WHETHER the ſouls of men departed are privy to our actions, and can appear or diſappear to human ſight?

Anſwer.

THE expectation of a retribution hereafter, to compenſate for the miſeries and inequalities on earth, ſeems to be the grand argument of thoſe that maintain the opinion of a future ſtate; but this proves the beaſts to have ſouls as much as it does man; and if this dogma has not prevailed, it has perhaps been for no other reaſon but becauſe beaſts have not been able to maintain a ſet of clergy. As to the dull maſs of legendary ſtories about apparitions and ghoſts, recorded by prieſts and monks, we have no reaſon to believe a word of it, ſince it was their intereſt to deceive the world; and they have likewiſe ſolemnly affirmed and particularized the exiſtence of fairies and witches, that are now univerſally acknowledged to be abſurdities, fit only to impoſe upon fools and to be credited by ideots. However begging the queſtion, and allowing that there actually may be ſuch things as ghoſts, and that they can appear and diſappear, yet I think we may confidently affirm, that they are not privy to our thoughts, nor to ſuch of our actions as were unknown to them before death; for on peruſing ſome hundred ſpeeches made (as they ſay) by ghoſts, I have been tempted to think, that if ever they had any ſenſe in their lives they muſt have loſt it at their deaths; and that they were ſcarce privy to their own actions, much leſs to ours, their diſcourſes were ſo completely ſtupid.

Query.

MILTON in his Paradiſe Regain'd, ſays, "And either "tropic now 'gan thunder, and both ends of Heaven,"—What is meant by both ends of Heaven?

Anſwer.

WHAT can the Poet mean (I do declare,)
But certain parts in the celeſtial ſphere;
Either the Poles, or our terreſtrial world,
There from the tropics, lightening ſoon was hurl'd.

Query.

Query.

IN the account of the Deſtruction of Sodom and Gomorrah, it is ſaid, that Lot's wife was turned into a pillar of ſalt. Is this to be underſtood literally?

Anſwer.

THE expreſſion "Lot's wife was turned into a pillar of ſalt." This is to be underſtood literally and according to the very letter of the text. For the plaineſt interpretation of ſcripture words is always the beſt; ſhe looked back diſobedient and unbelieving, and ſtruck with the ſulphureous fire from Heaven, was killed and became a pillar of ſalt; therefore a laſting memorial to many generations. Joſephus mentions to have ſeen it himſelf, and Mr. Maundrell's guides told him that ſome remains of the monument were ſtill extant. And as to the difficulty of ſalt continuing undiſſolved in the open air ſo long, it is well known to naturaliſts, that rocks of ſalt are as laſting as any other rocks, nay more ſo, and that houſes are built of them.

Query.

IT is well known that foſſil ſhells, petrified fiſh, and other marine productions are found in great quantities on the mountains in the inland parts of America. How is this to be accounted for?

Anſwer.

THE general deluge, or earthquakes, or both, might have been the two great cauſes mentioned in this phœnomena.

Query.

WHAT is the meaning of the expreſſion "Proteſtant flail," ſo often uſed in ſongs and poems about a century and a half ago?

Anſwer.

THIS expreſſion ſeems to mean any inſtrument in the hands of a proteſtant, wherewith to laſh and ſatiriſe his antagoniſt.

Query.

OLD Gobbo, in the Merchant of Venice, uſes the fooliſh oath, "by gods ſontis." What does he mean by "ſontis?"

Anſwer.

EVIL genii, or wicked, evil, blameful or hurtful perſon. For the word ſenticus, uſed adjectively, ſignifies wicked, evil, blameful, hurtful, &c. but ſubſtantively a wicked perſon, &c. &c.

Query.

FROM whence does the whiteneſs of ſnow proceed?

Anſwer.

FROM the componency of its parts; which though ſingly tranſparent, yet muſt appear white when mixed together; as do the parts of froth of powerful glaſs, and other tranſparent bodies whether ſoft or hard.

Query.

WE generally obſerve that the mercury in the barometer ſtands the higheſt upon the eaſterly and north-eaſterly wind. How is this to be accounted for? And why does the riſing of the quickſilver indicate fair weather, and its ſinking foul weather, ſuch as rain, wind, and ſo forth?

Anſwer.

IT is proved by experiment that mercury in the barometer ſettles as the barometer is removed upwards, which is occaſioned by a ſmaller degree of denſity in the atmoſphere. In a warm climate the eaſterly and north-eaſterly winds mixing with the air that is more expanded gives it a greater denſity, and the contrary when blowing ſoutherly, which wind continually blowing generally produces much rain. Why the mercury falls againſt rain, wind, and ſo forth, ſeems to proceed from ſimilar cauſes. In fine weather the clouds are obſerved to be ſituated very high in the air, at other times falling in rain to the earth, which produces changes in the barometer, in effect the ſame as if the barometer was removed upwards or downwards in the atmoſphere.

Query.

Query.

FROM whence came the cuſtom of putting laurel, box, holly, &c. in churches and houſes at Chriſtmas; and what is the ſignification thereof?

Anſwer.

WHEN the ſon of God (according to the Prophecy of Zachary) made his public entry into Jeruſalem, the people ſtrewed the way before him with ever-green palm branches, in token of the perpetuity and triumph of his kingdom: hence aroſe the cuſtom, and this the ſignification of adorning our houſes and churches with ever-greens at Chriſtmas.

Query.

THE Graſshopper ſings all the ſummer away,
With his chirping noiſe—how he makes it I pray?

Anſwer.

THE Graſshopper is called in Latin, Cicada, from ſinging with a little ſkin upon his ſide, againſt which he rubs the thick part of his leg, and ſo makes that noiſe wherewith he ſo diſturbs the ſleepy haymakers.

Query.

WHAT is the cauſe of that phœnomenon called the Aurora Borealis (or northern lights) and why is it now more common in our climate than formerly?

Anſwer.

ELECTRICITY ſeems to be the cauſe of the northern lights, which are ſtreams of the electric fluid diſperſed through a certain ſpace of the æriał expanſe. And this fluid may now more abound in our region than heretofore, or has altered its former, and taken a new direction.

Query.

HOW is it that during a total eclipſe of the moon, we can notwithſtanding perceive the moon as a light body, and ſee her diſtinctly, though ſhe is at the ſame time acknowledged to be in herſelf dark, and is eclipſed by the earth's ſhadow, the diameter of which is ſo much larger than the moon herſelf?

Answer.

IT has been proved that the earth is ſurrounded with a ſphere of air, called the atmoſphere, of about 47 miles in height, which has ſuch a retractive power, that it turns the rays of the ſun out of their way when it falls upon it, and makes them enter the conical ſhadow, which therefore will illuminate the moon as well as other bodies with a faint light, and make her viſible to the eye when ſhe is even in the midſt of the earth's ſhadow.

Query.

HAS the Cicindelo or Glow-worm, a natural power or not, to raiſe and extinguiſh its native light according to the direction of its will?

Answer.

THE Glow-worm has certainly a natural power to raiſe and extinguiſh its native light, but then only to be perceived in the dark, its ſkin being a kind of an electrified coat, which in the dark, appears as fire out of the ſkin of the Cicindelo.

Query.

MANY people are ſo ſtrongly fortified againſt the paſſions as not to ſhed tears for their own misfortunes, nor by ſympathy for the misfortunes of others. Are people in general with this ſeeming inſenſibility void of pity and humanity?

Answer.

WHEN and where grief happens, it ſeizes upon and affects the animal ſpirits, which are fluid, and belong to the brain; but ſometimes when grief happens it falls with ſuch a heavy preſſure upon the animal ſpirits, as does not admit of, or produce any agitation therein; then the apparent ſymptoms are nothing but a heavy groaning, or deep ſighing, as of one in ſore affliction, or miſery. In our opinion they have as much pity and humanity, or more ſo, than thoſe which ſhed tears abundantly.

Query.

REQUIRED the reaſon and cuſtom of having the figures of lions, goddeſſes, &c. at the head of ſhips?

Anſwer.

Anſwer.

THE ingenious traveller, Mr. Bruce, tells us, that according to the Abyſſinian hiſtorians, the famous Sphinx, which ſtands near the Pyramids, is the figure that was at the head of the Ark, petrified; hence it is probable the moderns derived the cuſtom of having the figures of lions, goddeſſes, &c. at the head of their ſhips.

Query.

YE learned pray ſay (who dark myſt'ries unfold,)
Why razors cut better with hot water than cold?

Anſwer.

EVERY kind of knife or razor is a fine ſaw, though we cannot poſſibly ſee it with the naked eye; and on all the edges of thoſe fine poliſh'd tools, there clings or ſticks a kind of a reſinous or gummy ſubſtance, which when put into warm water takes off the ſame, and makes the razor cut more eaſy and free.

Query.

IN common braſs-cocks that turn with a key, the liquor will flow to the top of the key-hole, and although it may be emptied, it will flow again to the ſame height and not run over, although the liquor may at the ſame time be one or two feet higher in the caſk: Required the reaſon of this?

Anſwer.

BECAUSE the air being a fluid body, preſſes upwards againſt the liquor, and in that hole is much greater preſſure downwards, and therefore will prevent its running out. See Martius Philo. P. 266.

Paradox.

MY wife and I did diſagree,
And for to part we both were free;
She ſet off eaſt and I ſteer'd weſt,
Believe me, Sirs, it is no jeſt;
When each had gone miles fifty-three,
Wife was not twenty yards from me;

And tho' it was bad ſtormy weather,
We all that time travell'd together:
How can this be, pray clear all doubt,
Tell how we made this different rout?

Anſwer.

On ſhip board my wife and I did diſagree,
I to th' helm, to th' other end of th' ſhip walk'd ſhe;
'Tis true we travell'd fifty miles together,
On the ſame ſhip, not minding wind or weather;
Yet all that time, upon my word and life,
I was not twenty yards from my dear wife.

Paradox.

DICK GUZZLE in cue, I heard him to ſay,
He owed twenty ſhillings, had not it to pay;
Ye ſages in numbers, he'd have you explore,
How that debt ſhall be paid with nineteen and no more.

Anſwer.

The $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{6}$, and $\frac{1}{19}$ of 19s. are 9s. 6d. + 6s. 4d. + 3s. 2d. and + 1s. 0d. = 20s. = 1l.

Paradox.

INGENIOUS artiſts, pray diſpoſe,
Twenty-four trees in twenty-eight rows,
Three trees I'd have in every row,
A pond in the midſt I'd have alſo;
A plan of it I fain would have,
Which makes me for aſſiſtance crave.

Anſwer.

A PLAN here is drawn,
In the ſcheme it is ſhewn,
Will ſuit the curious requeſt,
You may ſit if you pleaſe,
And view the ſweet trees,
Or fiſh, if it pleaſes you beſt.

Paradox.

I THRASH'D ten quarters of fine wheat,
I eat juſt thirty pounds of meat,
Beſides a calf that weighed eight ſtone—
I eat the whole, pick'd every bone;
Yet more—my appetite to ſatisfy,
Eat three roaſt pigs—which made me dry;
Drank ſixteen pints of cherry-brandy,
Then eat five pounds of ſugar-candy:
All this I did—all in one day:
It's true, I aſſure you, what I ſay.

Anſwer.

4d. NEAR the Poles ſuch a wonder as this might appear,
Where one day and one night make up the whole year.

Paradox.

A GENERAL he had a ſmall army of men,
Which form'd a long ſquare of juſt twelve times ten;
But ſtill without having his number increas'd,
In twelve equal rows he would have them plac'd;
Juſt eleven men he would have in every row,
Himſelf equal diſtant from each row alſo,
How he muſt place them I gladly would know.

Anſwer.

To place the ſmall army I thought I would venture,
In a dodecagon therefore, and himſelf in the centre.

Paradox, by a Lady.

ONE ſummer evening as I was abroad taking my pleaſure, I heard the voice of ſomebody behind, calling to me; I turned back, and ſaw it was a companion of mine at the diſtance of 400 yards, wanting to overtake me; we moved each of us 200 yards

yards with our faces towards each other in a direct line, yet we were ſtill 400 yards aſunder.—How can this poſſibly be?

Anſwer.

THE lady moved 200 yards backwards with her face towards her companion's, and her companion 200 yards forwards, with his face towards her.

Query.

IS hope or fear the greateſt ſpur to action?

Anſwer.

HOPE and fear are the two moſt predominate paſſions of the human mind; the hope of enjoying ſome good, or the fear of ſuffering ſome evil, is the ſpring of almoſt every action we perform, and it is difficult to ſay which is the greateſt ſpur to action; but we rather think hope is, at leaſt it is the moſt noble paſſion of the two.

Query.

WHAT language is the beſt, impart,
To gain a virgin lover's heart?

Anſwer.

THE language of Cupid's dart,
Will win and fix the virgin's heart.

Query.

WHEN, and by whom, was England divided into Pariſhes?

Anſwer.

As Mr. Aſhton tells us, (ſuppoſed from his Dictionary) that Alfred divided the kingdom into ſhires and hundreds; and by referring to the ſaid Dictionary may be ſeen, who divided the kingdom into pariſhes.

Query.

WHAT is the meaning and language of Crom aboo, the motto of the Duke of Leinſter?

Anſwer.

Anſwer.

CROM aboo, ſuppoſed to be an Anagram, being an unknown language, makes Aboo crom by tranſpoſition; which, by corruption, may ſignify the Abercromby family of Scotland, from whence might ſpring the Duke of Leinſter's family, and thence the motto. For Dean Swift diſcovered, that the Greek and all other languages may be derived from the Scotch: ſhewing us, that the North-Britons are part of the original people.

Query.

WHETHER the Conception of the bleſſed Virgin Mary, on December 8, is not placed wrong in the Calendar, ſeeing that the birth of Chriſt was on the 25th of that month? Or, how is the time of the conception and birth of Chriſt reconciled, as fix'd by our eccleſiaſtical chronologers?

Anſwer.

HAD the conception of Chriſt been placed on the 25th of March, or on what is uſually called Lady-Day, and the Birth of Chriſt the 25th of December following, about nine months aſunder, between the conception and the birth, according to what is obſerved to happen in the production of the human ſpecies, (to which nature Chriſt was tranſlated from the Divine eſſence,) the time of pregnancy would have appeared more conſiſtent with the other parts of the Goſpel. But why the conception ſhould be placed on the 8th of December, and the birth on the 25th of December, following or preceding, (who can tell us which?) making 17 days, or a year wanting 17 days, in the time of the pregnancy, our divine legationiſts, and alterers of Greek from its original propriety, muſt reſolve, as their province of unfolding profound myſteries.

Query.

WHETHER an invalid (or invalidated) underſtanding, or weak body (according to the Scotch phraſe) is the more to be pitied?, or, whether folly or ignorance is the greateſt misfortune?

Anſwer.

Anſwer.

AN invalidated underſtanding, and a weak body, (in the Scotch phraſe,) imply the ſame ſort of poor things! and are therefore alike to be pitied! like a charity-ſchool teacher, and a ſmatterer in mathematics, weak enough, through vanity, to criticiſe works of eminence they never underſtood; like the Danmonium, (as he ſtiled himſelf,) and library-hall profeſſors, exonienſis, &c. As to folly, (ſeparately conſidered,) it is a greater misfortune than ignorance, by itſelf, which would often reſt ſatisfied; but being ſtirred up by folly in the ſame perſon, it is prompted to aſſume a falſe eminence, which is attended with contempt, ridicule, and diſgrace; and ſo folly becomes a greater misfortune than ignorance to the ſame owner. To be ignorant and innocent are pitiable! to be ignorant and vain, deſpicable!

Query.

WHETHER giving a man what he wants, is, (in a grammatical ſenſe) not taking that want entirely away? And whether want or ſhame, in another ſenſe, may not be given him, contrary to the ſenſe of taking want or ſhame away from him?

Anſwer.

ON the ſubject of lying, Hudibras ſays to Sidrophel, (Heroical Epiſtle, l. 105,) as follows:

ALAS, that faculty betrays
Thoſe ſooneſt it deſigns to raiſe;
And all your vain renown will ſpoil,
As guns o'ercharg'd the more recoil;
Though he that has but impudence,
To all things has a fair pretence;
And put among his wants but ſhame,
To all the world he may lay claim.
But all impoſtors, when they are known,
Are paſt their labour, and undone.

GIVING truth to a perſon who wants it, is taking ſo much of his error away from him, that he before had. Now ſuppoſe you put ſhame among his wants, (want of truth, ability, &c.) according to the text, ſo that ſhame may be one of his wants,

wants, and by his poſſeſſing impudence, he may then lay claim to any thing. In this ſenſe, contrary to the former, by giving him ſhame among his wants, you furniſh him with want of ſhame; and he having no ſhame, you furniſh him with a negative, inſtead of taking one that he had, (want of ſhame) away.

Query.

AT a place called Catſgrove, near Reading, in Berks, is to be ſeen a natural curioſity, not noticed by Camden in his deſcription of that County, where are different ſtrata of earth, and, among the reſt, beds of ſea ſand; from which the workmen, belonging to a limekiln on that ſpot, dig up perfect oyſters, firm and unopened, and ſhew them to travellers. Without recurring to that general ſea, for all difficulties of this ſort, Noah's Flood, it is required to be known, if the ſpot, whereon the town ſtands, was ever recorded in hiſtory to have been overflowed by the ſea, from an earthquake, or any other cauſe?

Anſwer.

THE oyſters and other ſubſtances, dug up at Catſgrove, near Reading, in Berkſhire, are, in my opinion, the conſequence of ſome ſubterraneous eruption, (as are the variety of ſtrata in other parts) whereby the ſea has ſhifted its place and boundary, and left the diverſity of ſea ſtrata, oyſters and other marine ſubſtance, as they are found and appear from the ſaid ſhifting cauſe, which cauſe is the change of ſituation of the ſea; overflowing vaſt tracts of dry ground, and leaving others, that were covered with ſea, to unboſom its variety of foſſils, or textures of an earthly ſubſtance; or elſe to be covered with verdure, as the ſeeds of vegetables, ſcattered up and down the ſubſtance of the whole earth, and the impregnating air, took effect.

Query.

THE word reſt (meaning the remaining or remainder) is ſet down in Dr. Johnſon's Dictionary both as a ſubſtantive and as an adjective. It will not ſtand the teſt of an adjective, becauſe it will not be coupled with a known ſubſtantive (ſuch as things) and make ſenſe by ſuch a conjunctive, the reſt things being nonſenſe; and it ſcarce appears to be a ſubſtantive for

for theſe reaſons: 1. Becauſe ſome ſubſtantive ſeems underſtood to belong to it, which is not named: 2. As it cannot be uſed in the ſingular number, (as equivalent to remainder, a known ſubſtantive) the reſt is, being a ſoleciſm; and laſtly, as there would then be no word that exactly correſponds with the Latin word *teliquus* or *reliqui*. Quere, then, whether it be a ſubſtantive or an adjective? or ſometimes one and ſometimes the other?

Anſwer.

THE word reſidue retains the ſame ſenſe as the word reſt, or remainder; therefore it certainly is a ſubſtantive; and no adjective, like reſidual.

Query.

BISHOP LOWTH, among other of his ingenious and critical remarks on Engliſh ſoleciſms, animadverts on the following expreſſion.—"Who do you think me to be?"—and condemns it for a fault. He will have us ſay, "Whom do you think me to be?" Now, the queſtion is, whether in this we are to follow the analogy of the Latin and Greek language, which agree in putting the ſame caſe before as after the infinitive mood!—as, quem credis me eſſe? or whether we are to examine the merits of the caſe by a tranſpoſition; which is a good method of explanation, and preſents us with this ſeemingly uncouth expreſſion, Do you think me to be whom? In a word, whether the appoſition of caſes ought here to predominate over that known rule, that neuter verbs require a nominative caſe after them?

Anſwer.

ACCORDING to cuſtom, in the Engliſh mode of ſpeech, which is the greateſt authority, Biſhop Lowth is got into a dilemma here, betwixt the Engliſh and Latin cuſtoms of ſpeech, where the Engliſh cuſtom, by the rule of tranſpoſition, ought to be predominate: Do you think me to be who? or, Who do you think I am? ſomebody or nobody?

Query.

UPON what part of the terraqueous globe has a ſhip the leaſt preſſure upon the water?

Anſwer

Anſwer.

ANY where on the ſea, under the equinoctial, or at the equator; for there the power of gravity is leſs than at the poles, where the diameter of the earth's oblate ſpheroidical figure is the ſhorteſt, and conſequently attraction greateſt.

Query.

WE read in Herodotus, (Erato,) that, when it was objected to Demaratus, King of Sparta, by his rival Leutychides, that he was not the ſon of Ariſton, his reputed father, but a ſuppoſitious child, he conjured his mother, to reveal the truth: who, in anſwer, obſerved to him, that his enemy framed the objection merely becauſe he was born before the expiration of ten months; but that the inſinuation was ſuggeſted by ignorance; for women, ſhe remarked, were not always ſo late in their delivery; ſome children having been born at the end of nine months from their conception, and ſome even at ſeven.—From this ſtory, be it true or falſe, it appears that a child of nine months was judged an early viſitant in Greece; at leaſt, by the Hiſtorian.—Query, Are the women of any country (particularly in that part of the world) known generally to exceed that term, or not?

Anſwer.

WHEN men lived to a greater age in ancient times, the time of a woman's pregnancy (to perfect a more durable birth) might be greater than at preſent, nine months. Some children have been born at the end of ſeven or eight months in England, but ſeldom lived long, or not ſo long as thoſe born at their full time. However, nine Calendar months, of thirty days and a half each, making about two hundred and ſeventy-five days, are not much unequal to ten months of twenty-eight days each, making two hundred and eighty days; ſo that a difference of near a month, in the time of a woman's pregnancy, will ariſe from the different way of reckoning the time of one month; from whence the miſtake of a month in the time of pregnancy, (ten for nine months,) by Leutychides, might proceed.

MOST animals (except mankind) have ſtated ſeaſons for procreation. The females go with young ſome a longer, ſome a ſhorter time. Mares go from eleven to twelve months;

cows and hinds go nine months, the ſame as women; foxes and wolves five months; bitches go only ſeven weeks; cats nine weeks; and rabbits thirty-one days. Moſt birds are hatched in twenty-one days; the Canary birds, and ſome others, are hatched in thirteen or fourteen days. Hence there appears to be endleſs variety in the time, as well as in the manner, of the generation of animals.

Query.

YE lovely fair, ye ſoft enchanting maids,
That love the town, and haunt the rural ſhades,
Say, if you can, when kiſſing firſt aroſe,
That mark of love, and ſoft'ner of our woes;
Say, if you can, inform your faithful ſwains,
And you ſhall have a hundred for your pains.

Anſwer.

WHEN Adam firſt beheld his partner Eve,
Bleſt with more charms than we can well conceive,
A warmth unuſual glow'd within his breaſt,
He kiſs'd his bride, and own'd that he was bleſt.

Query.

DEFINE the diff'rence of what you call
A conſcience that's large, and no conſcience at all.

Anſwer.

A COUNTRY-WOMAN begg'd a boon
Of a rich Merchant, here well known;
Who, generous heart! quite free to all,
Of packthread handed down a ball,
That meaſur'd twelve-ſcore yards—to grant—
And bid her take what ſhe might want.
She talk'd—roll'd off,—to tire your patience,—
At laſt ſaid, 'Here's enough in conſcience.'
The Merchant ſmil'd,—and ſaid, "Let's ſee
'What may a woman's conſcience be?'
He found it forty yards in all;
If ſhe'd had none, ſhe'd ta'en the ball!

Quer

Query.

A HEAVY body, being ſunk to the bottom of any fluid, will it require more or leſs weight than itſelf to raiſe it up?

Anſwer.

By the laws of Hydroſtatics, a leſs weight than itſelf will raiſe it up; but in a ſtagnant or confined fluid, or one that has a great degree of tenacity, or if the body be in cloſe contact with the bottom of the containing veſſel, &c, it may require more weight than itſelf to raiſe it up.

Query.

PRAY give your opinion how the fiſhes can reſpire air in the ſea?

Anſwer.

There are many ſorts of fiſh endued with lungs; as whales, ſea-calves, dolphins, with others: and theſe are generally obſerved to ſwim near the ſurface of the water, and receive pure air, never remaining long at the bottom: But in thoſe fiſhes that are without lungs, 'tis preſumed the gills perform the office of lungs; and that the æreal particles are admitted through the pores into the numerous veſſels there inſerted, and thence again expired.

Query.

WHEN were guineas firſt coined in England? and why were they ſo called?

Anſwer.

In King Charles the Second's time, when Sir Robert Holmes, of the Iſle of Wight, brought gold-duſt from the Coaſt of Guinea, a guinea firſt received its name from that country.

Query.

IF whatever is, is right, in the natural world, (according to Mr. Pope's Ethics, in his Eſſay on Man,) and God has formed nature and her operations, in all reſpects for the beſt, why is rain, or elementary weather, prayed for in churches? or why is any thing prayed for, by the human ſpecies, of defective judgment, (according to the wiſe Socrates,) that God would

grant ſuch things as are fit for us, and keep away ſuch things as are not fit, in reſpect of particular and general good?—And why are not curſes baniſhed all catholic and chriſtian churches, if God and his Providence can award juſtice to criminals, without the imprecations beſtowed from man's pitiful, partial, and weak judgment, in this reſpect; whoſe whole irregular race, governed by a lawleſs will, ſeems to be greatly favoured by a gracious and good God, in not being long ago extirpated from the face of the whole earth, for the enormous treſpaſſes of the greater part of them, committed againſt their Maker and one another?

Anſwer.

To pray for rain in churches, or elſewhere, appears to be the ſame as to pray for ſnow, dry weather, or ſunſhine, and for ſuch things as people's fancies or wrong judgments, or different views and vain imaginations, ſuggeſt to them. For, the operations of nature are ſuppoſed to be univerſally carried on every where for the good of the whole; and if it be true, what Mr. Pope ſays, in his Ethic Epiſtles, there can be no error in nature:

In ſpite of pride, in erring reaſon's ſpite,
One truth is clear, whatever is, is right:

To which may be ſubjoined.

Except man's will, exempt from nature's laws,
In ſpite of doubt, our good or evil draws.

Persons of the ſame or different occupations and intereſts pray for different elementary weather at the ſame time and place. So different armies pray to God for different ſucceſſes, or deſtruction. And how is it conſiſtent for God to oblige both parties?

If God's will be done on earth as it is in heaven (prayed for in the Lord's Prayer, in churches,) there is little occaſion for other ſolicitations of the divine power and goodneſs, ſince aſking what may be unfit for us will prove a hurt inſtead of benefit; as the farmer, in the fable, reſigned the weather into Jupiter's hands again, when he had enjoyed what weather he aſked for, and found his crops worſe than his neighbour's.

One part of the Scripture teaches to bleſs them that curſe you, and pray for them that deſpitefully uſe you, libellers, &c. againſt

againſt the church doctrines of curſing our fellow beings! But though the texts of Scripture ſeem to claſh with each other in different places as the ſtatute laws in different acts of parliament differ ſo much as ſometimes to require an adjuſtment, (like a Hadley's quadrant,) yet the divine and human commands, in general, are reconciled by a general obedience to morality and religion, and an abſtinence from vice and injuſtice.

The irregularities of man's race require to be put under laws and government, as is evident from their various and irregular propenſities and inclinations; yet the deviation of thoſe wills from equity and juſtice, with reſpect to their conduct towards one another, is ſuch, that ſometimes no force or puniſhment, by cutting them off, is able to reſtrain their irregularities aud keep them in order.

The infinitely wiſe Being, permitting men's irregularities, (for experiment or probation,) to anſwer the ends of his glorious creation, he can diſpoſe of them here, or remove them from this to another ſtate of being, as he ſees beſt fit. And ſince all created beings are within the graſp of the Divine Power, to do with them the way moſt ſuitable to his pleaſure, therefore to ſubmit, (by reſigning to his providence) is the right human wiſdom.

Yet the race of mankind (corrupted as it is) is certainly at liberty to aſk of God to grant what is fit and good for their happineſs; and, while they aſk, to beg that he would avert or refuſe what is againſt their happineſs, or hurtful to them, though aſked.

Query.

SAGACIOUS friends, inform me whence ariſe
Thoſe Northern lights that ſtream along the ſkies?

Anſwer.

The cauſe of the Northern lights is from a thin, nitrous, ſulphurous vapour, raiſed in our atmoſphere, conſiderably higher than the clouds. This vapour by fermentation taking fire, the exploſion of one portion of it kindles the next, ſo the flaſhes (of the Aurora Borealis or Northern lights) ſucceed one another, till the whole quantity of vapour within their reach is ſet on fire. See Rowning's Natural Philoſophy, p. 158.

It is alſo ſaid that the Northern lights proceed from the vapours aſcending by exhalation.

Query.

WHAT became of the ark of the Lord, containing the two tables of ſtone, after being depoſited in Soloman's Temple, as mentioned in the 8th. Chapter of the 1ſt. Book of Kings? The Jewiſh opinion is, that, when the Temple was deſtroyed, the earth opened and ſwallowed it.

Anſwer.

No doubt but the ark of the Lord was burnt with the Temple; which may be a ſufficient reaſon for the extreme grief of the Jews; for as Joſephus emphatically expreſſes it, they lifted up their heads and wept.

Query.

WHY are thoſe two months, March and October, reputed to be the beſt to brew in?

Anſwer.

BECAUSE in thoſe two months the medium ſtate of the air between the extremes of heat and cold, is moſt favourable to a due carrying on the proceſs of fermentation; on the proper management of which, it is well known, that the perfection of malt liquors depend.

Query.

BY whom, and about what time were bliſters made of cantharides, introduced into medical practice?

Anſwer.

BLISTERS made of Canthurides were firſt introduced into medical practice by Aretæus, a Greek phyſician and medical writer; about 50 years before Chriſt. See Clerc's Hiſtory of Phyſic.

Query.

WHY does the horizon appear to our ſight larger than any part elſe of the hemiſphere?

Anſwer.

NOTHING can come within the compaſs of our eyes ſo well becauſe the earth on plane of the horizon, is decorated with tree

trees, herbs, plants and graſs, which makes it appear of a fine azure green, and exactly ſuits our ſight, better than any other colours under the creation; and therefore lets the eyes comprehend more of the horizon than any part elſe of the hemiſphere.

Query.

WHAT branch of natural philoſophy affords the moſt convincing arguments of the exiſtence of a Supreme Being?

Anſwer.

ASTRONOMY; for it is impoſſible for any man to look round him and view that amazing orb the ſun, that loud herald of his Maker's praiſe, from whoſe benign agency nature receives her beauteous features—the moon which when the ſun goeth down lights up her ſilver lamp to bleſs mankind—thoſe planetary worlds which run their rapid courſes round the ſun—or thoſe bright ſpangles with which the empyreum arch is decorated, but he muſt be convinced that theſe are the works of a Being infinite in power, immenſe in wiſdom, and unbounded in goodneſs.

Query.

WHAT is the reaſon that the ſhells of crabs and lobſters on being boiled, turn red?

Anſwer.

THE deep purple inclining to blackneſs is only a ſuperficial covering on the calcareous earth compoſing the ſhells of crabs, lobſters, &c. and when its denſity is attenuated by heat in the action of boiling, the light reflected from the white ſubſtance of the ſhell is tranſmitted more copiouſly through this film and gives it the appearance of red, &c.

Query.

WHY is King Henry the Eighth always (or generally) drawn with a cap on, inſtead of a crown?

Anſwer.

HENRY the Eighth received from the Pope, the title of Defender of the Faith, for having written againſt Luther, and preſented

preſented him a Cardinal's cap, in which he is generally delineated.

Query.

HOW long has the title of Lord Mayor been given to the Mayor of London, and on what occaſion was it firſt conferred?

Anſwer.

IN the hiſtory of England it is recorded, that about the year 1381, or 1382, (in the reign of Richard II.) when William Walworth, the then Mayor of London, had ſlain the rebel Wat Tyler, the King knighted Walworth, and ordered that the Mayor of London ſhould ever after bear the title of Lord.

Query.

AS black is no colour and conſequently reflects no rays to impreſs any colour on the retina of the eye, how comes it that bodies that are black are as viſible as any other object?

Anſwer.

WHEN bodies which are black are placed upon, or ſurrounded with bodies of any other colour, 'tis the coloured rays reflected from ſuch bodies around the margin of the black that defines its ſhape.

Query.

CAN love exiſt without jealouſy?

Anſwer.

WHOEVER conſiders that what we love we always ſet a high value upon, will not think it an unreaſonable conſequence that we ſhould be afraid of loſing it; beſides, what appears lovely to us, we are apt to think does ſo to others, which would naturally make them endeavour after the poſſeſſion of it as well as ourſelves, and therefore gives us no ſmall uneaſineſs for fear of being diſappointed. And even ſuppoſing the beloved perſon to be virtuous and conſtant, yet a great paſſion will be apt to ſuggeſt that it is not impoſſible, but an alteration may happen, either through ſome diſlike or by the intervening of a more worthy object; ſo that it is contrary to the nature of love to be free from jealouſy before marriage: but after,

where

where the perſons are good and generous, it ſeldom or never happens.

Query.

WHAT is the origin of heraldry? and how remote is its antiquity?

Anſwer.

It ſeems very difficult to determine how long heraldry has been in uſe as it now is, but its origin is of very ancient date. The earlieſt account we have is in ſacred writ, in the 2d. chap. of Numbers, when we have an account that each tribe of the Iſraelites had their particular ſtandard, and there is no doubt but each ſtandard had ſome particular mark or figure, and later Jewiſh writers inform us, that theſe figures were characteriſtic of the tribes; Judah had a lion on their ſtandard; Dan a ſerpent; Iſachar an aſs, &c. whether theſe were of divine appointment originally, or borrowed from the Egyptians, who were famous for their hieroglyphics, is not certain. But after that time ſtandards were uſed in war, and are to this day, each Regiment having its peculiar ſtandard or colours; and as theſe formerly had figures of birds and beaſts that were thought emblematical or ominous by the general or leader, the ſame figure was engraven on a ſeal, with which the general or chief ſtampt all his orders to his inferior officers, and the deſcendants of ſuch chiefs uſed thoſe figures painted or engraven on their ſhields, &c. as a family diſtinction; and is thus uſed to this preſent day. It may farther be remarked, that the various tribes of Indians in North America, to this day uſe the figure of ſome bird or beaſt to diſtinguiſh them from other tribes. See Captain Carver's Travels.

Query.

WHY is the thick part of the leg call'd the calf?

Anſwer.

The calf of the leg ſeems to have had its name from two cimbric words, cal, ſtout for large, with reſpect to the other parts of the leg, and lef, always bent, or of a bending form, (vid. Goropius Be amus) and from thence the Dutch name kalf, from this the Engliſh is evidently borrowed.

Query.

Query.

WHEN a piece of iron is heated red hot, and immediately cooled in water, it becomes harder; but if left to cool in the open air, ſofter: Can this be accounted for?

Anſwer.

WHEN a piece of iron is heated red hot, and immediately cooled in the open air, its bulk becomes greater, or it occupies more ſpace, and therefore the particles compoſing it are at a greater diſtance from each other than before, and conſequently the whole is leſs compact and ſofter. But the contrary happens if cooled in water, for in heating, a great part of the air it contained is excluded by that operation, on account of its expanſion and rarefaction; then ſuddenly plunging it in water, the air is thereby prevented from inſinuating itſelf into the metal while it cools, and ſo the particles having more room, fall nearer together, which evidently muſt render it of a firmer texture.

Query.

WHETHER a practical geometer can execute the firſt problems of geometry trueſt with great or ſmall diſtances?

Anſwer.

PROBLEMS in plain geometry can be drawn more exact with great diſtances than with ſmall, becauſe all points and lines in pretice are of the ſame breadth, and ſuch breadths will hold a leſs proportion with great than with ſmall diſtances, and conſequently the errors in drawing will be leſs in uſing long lines than ſhort ones. To explain this, ſuppoſe the circumference of a circle, whoſe diameter is one tenth of an inch, is to be divided into 1536 equal quarters, by lines drawn from the centre, this we will ſuppoſe to be done by a continual biſection of the cords; now when we come to the laſt diviſions, we ſhall find, that the lines which are to divide the cords will be as broad as the cords are long, though perhaps the inſtrument may be as fine as poſſible; but this would not be the caſe if the diameter was two or three yards.

Query.

Query.

WHENCE proceeds the ſaltneſs of the ſea,—and is it more ſo now than formerly?

Anſwer.

ACCORDING to ſome naturaliſts it is owing to the mines of ſalt gem in the bowels of the earth waſhed down by the rains. Admitting this, the ſea muſt grow continually ſalter, becauſe the water raiſed by evaporation is freſh. On this ſuppoſition Dr. Halley propoſed a theory to determine how long the world has ſubſiſted; but as obſervations have not been made of the degree of its ſaltneſs at diſtant periods of time, it muſt be left to the determination of the curious in future ages.

Query.

INGENIOUS artiſts, make appear,
How long ſince hats firſt came in wear?

Anſwer.

FATHER Daniel relates, that hats became in uſe in the time of Charles II. about 1449; but the Dictionaire des Origines, which is more to be depended upon, tells us, that they were not worn till the time of Charles VI. when they were uſed by the nobility when they rode a hunting.

Query.

IF a perſon breathes upon the blade of a new knife, razor, &c. the moiſture immediately flies off. What is the reaſon of this?

Anſwer.

TAKE a razor or knife and heat it till it is as warm as the breath, and then the experiment fails; the reaſon is obvious: as the breath contains much moiſture, when it meets with a body colder than itſelf, that moiſture is condenſed, and this is the cauſe why the breath is ſo diſcernible in froſty weather. Now if we breathe upon any fine poliſhed reflecting ſurface, colder than the breath, the moiſture thereby condenſed becomes a kind of cover, and conſequently viſible; this cannot be the caſe when the body is ſufficiently warm, for then no condenſion can take place. The evaporation of ſo very ſmall a quantity of

of moiſture muſt be performed almoſt ſuddenly, may be eaſily conceived by a compariſon with Dr. Halley's experiments, who found that the common evaporation of water amounts to about one fifth of an inch per diem; and we may ſafely affirm, that the evaporation in queſtion would not exceed that quantity, were it to continue for the ſame ſpace of time. This circumſtance muſt alſo happen if we breathe upon bodies not poliſhed, but that is the very reaſon why we do not perceive it.

Paradox.

ONE evening as I walk'd to take the air,
I chanc'd to overtake two ladies fair;
Each by the hand a lovely boy did lead,
To whom, in courteous manner, thus I ſaid:
Ladies, ſo far oblige me, as to ſhew,
How near akin theſe boys are unto you?
They, ſmiling, quickly made this dark reply,
Sons to our ſons they are, we can't deny:
Though it ſeems ſtrange, they are our huſbands brothers
And likewiſe each is uncle to the other:
They both begot and born in wedlock were,
And we their mothers and grandmothers are,
Now try if you this myſtery can declare.

Anſwer.

Two widow ladies married were,
Each to the other's ſon;
And they both pregnant did appear,
E'er one full year was run.
The conſequence of which did prove,
To each a charming boy:
This did cement their huſbands love,
And added to their joy.
By this event likewiſe its plain,
They did commence grandmothers,
And that their huſbands did obtain,
Two young delightful brothers.
A brother you may juſtly call
Each to the other's father;
Uncles they were reciprocal.
You eaſily may gather.

Para

Paradox.

TWO fav'rite fields near to my dwelling lie,
Their ſoil the ſame in depth and quality.
The furtheſt diſtance, twenty acres meaſures;
The neareſt ten, but fraught with latent treaſures;
For, till'd alike, this yields me as much grain
As does the firſt, though full as big again.

Anſwer.

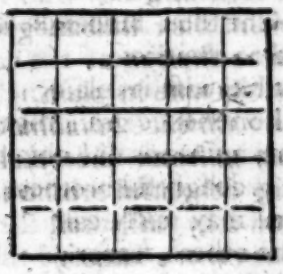
Becauſe corn and trees always grow perpendicular to the horizon, an hemiſpherical hill of twenty acres ſurface, will bear no more of either, than a level field of ten acres ſurface, being equal to the horizontal and circular baſis, which the ſaid hill ſtands upon. And no more pales are required to fence over any hill, than would be required to fence over the level baſis of the ſame, were the hill entirely removed, *i. e.* both palings being carried over the ſame horizontal direction.

Query.

THERE is a ſquare piece of land containing 25 acres, deſigned for the reception of 24 poor men and their governor, who are each to have a houſe ſituated in his own ground, the governor's in the center. How many people's land muſt the governor paſs through, before he gets to the outſide of the whole?

Anſwer.

Two, for the ground being a ſquare, it will conſiſt of 5 rows each 5 acres, as per figure.



Query.

IF a ſervant ſees any ill actions, or ill practices of a man or his wife one againſt the other, ſuch as adultery, or the like, which tend to the ruin of each other—ought not ſuch a ſervant to diſcover the ſame to the party injured? And if upon ſuch diſcovery the man and his wife do part—Which is truly, properly, and equitably the cauſe of ſuch ſeparation, the informer, or the crime and criminal?

Anſwer.

So important a diſcovery ought never to be made without mature deliberation; if not, the advice of a faithful friend. For in many circumſtances the injured party may be more happy in the ſuppoſed innocence of their adulterous mate, than under the torture of ſo ungrateful a diſcloſure. But if upon a prudent diſcuſſion of the matter, you have reaſon to conclude, that your diſcovery will prevent the ruin of one ſo heinouſly abuſed, you are under a ſtrict obligation of performing ſo charitable an office. And if upon ſo neceſſary a diſcovery a ſeparation ſhould enſue, the injured party is the efficient, the criminal the formal, the informer the inſtrumental cauſe of ſuch a ſeparation.

Query.

HOW old, and from whence is the cuſtom of throwing at cocks on Shrove Tueſday?

Anſwer.

THERE are ſeveral different opinions, concerning the origin of this cuſtom—But we are moſt inclined to give credit to one Cranenſtein, an old German author—who ſpeaking of the cuſtoms obſerved by the Chriſtian nations, gives us the following account of the original inſtitution of the ceremony.

WHEN the Danes were maſters of England, and lorded it over the natives of the iſland, the inhabitants of a certain great city, grown weary of their ſlavery, had formed a ſecret conſpiracy to murder their maſters in one bloody night, and twelve men had undertaken to enter the town-houſe by a ſtratagem, and ſeizing the arms, ſurprize the guard which kept it; at which time their fellows, upon a ſignal given, were to come out of their houſes and murder all oppoſers: but when they

they were putting it into execution, the unuſual crowing and fluttering of the cocks, about the place they attempted to enter at, diſcovered their deſign: upon which the Danes became ſo enraged, that they doubled their cruelty, and uſed them with more ſeverity than ever. Soon after they were forced from the Daniſh yoke, and to revenge themſelves on the cocks, for the misfortune they involved them in, inſtituted this cuſtom of knocking them on the head, on Shrove Tueſday, the day on which it happened. This ſport, though at firſt, only practiſed in one city, in proceſs of time, became a natural divertiſement, and has continued ever ſince the Danes firſt loſt this iſland.

Query.

WHETHER ſage of virtue infuſed, be more wholeſome than Indian-tea?

Anſwer.

Bohea-tea has the pre-eminence, as corroborating the ſtomach, helping the concoction of aliments and cholic pains, in the expelling of wind. Green-tea helps the ſuppreſſion of urine, in the free excretion of it; which are much more efficacious properties than are in ſage, &c.

Query.

WHY Jeſus Chriſt is ſaid to be of the ſeed of David, and to what purpoſe is the genealogy of Joſeph given, when Mary conceived before ſhe came at him?

Anſwer.

To the firſt queſtion we reply, that Jeſus Chriſt is therefore ſaid to be of the ſeed of David, becauſe born of the Virgin Mary, who proceeded from David by lineal deſcent.

In anſwer to the ſecond, we aſſign the following reaſons of Joſeph's genealogy, but founded on this neceſſary preliminary, that St. Matthew wrote his goſpel primarily for the Jews, to whom, in the genealogy, he has a peculiar regard.

1. The Jews looked upon Joſeph as real father to our Bleſſed Lord. If therefore they have ſuſpected Joſeph to have deſcended from any other line, this would have prejudiced their minds againſt the Goſpel diſpenſation. St. Matthew therefore, to remove this mighty rock of offence, acquainted his country-men, that in caſe Jeſus Chriſt had been really the

ſon of Joſeph, he had, on that account, been of the family and lineage of David.

2. St. Matthew, by tracing Joſeph's anceſtry, informed the Jews, that as Jeſus Chriſt was naturally the ſon of David by his mother's, ſo he was legally ſo by his reputed father's ſide. And it would be no ſmall ſatisfaction to them to behold their Meſſiah doubly the ſon of David, both by natural and imputative deſcent.

3. A mother's family was reputed as no family among the Jews, and therefore our Lord could be no otherwiſe inrolled, than under Joſeph's pedigree. Very pertinent was it then to give the Jews to know, that in one ſenſe he would appear as the ſon of David in their public regiſters.

4. Joseph and Mary were both of the ſame family, and could not be unknown to the Jews, for whom St. Matthew wrote. While therefore he preſented them with Joſeph's genealogy, at the ſame time he acquainted them with that of Mary's, and he choſe to give them Joſeph's rather than Mary's, when either would ſuffice, in compliance with the received cuſtom of his country, which (as is ſaid above) made no account of the mother's family.

5. From the premiſes we may aver, that St. Matthew deduced Joſeph's genealogy, with deſign to ſhew that Jeſus Chriſt was every way the ſon of David; that as he came to fulfil all righteouſneſs, ſo he would evidence every punctilio of royal derivation.

Query.

WHEN a man upon his trial, ſays, he will be tried by God and his country, the clerk ſays, "Culprit, God ſend you a good deliverance:" Pray what is the ſignification of culprit?

Anſwer.

The Athenians have given ſome account of this. We are of opinion, that when the perſon pleaded not guilty, and put himſelf upon God and his country, for a trial, the clerk pronounced theſe words, "Qu'il le paroit," let it appear ſo: i. e. Let it appear to God and your country, that you are not guilty of the crime you ſtand charged with; ſo that culprit appears to be a corruption of qu'il le paroit.

Query.

Query.

WHETHER a perſon that has compounded with his creditors, is not ſo ſtrongly concluded by the above rule, as to be incapable of performing any act of charity acceptable to God, before he has fully diſcharged the debts he compounded?

Anſwer.

THAT acts of charity may be acceptable to God, they ought to be done with all the ſimplicity and ſincerity of heart imaginable, out of a juſt ſenſe of the duty we owe, and the dependance we have upon him, and not from our being ſtruck with the miſery of an object.

IN the next place, what is ſo given ought to be ſtrictly our own, which a perſon that has compounded with his creditors, ought not to think ſo, till he has ſatisfied all their juſt demands upon him; ſo that to make his charity acceptable to God, he muſt come up to thoſe rules. For though his creditors may give him a legal diſcharge for his compoſition, he can never be diſcharged in conſcience, till he has paid the laſt farthing: but divines allow a liberty in ſmall acts of charity, which can be no damage to creditors, and where we may preſume upon reaſonable men.

Query.

WHETHER perſons who murder themſelves, may poſſibly be ſaved; and if ſo, why are they denied chriſtian burial?

Anſwer.

THAT thoſe guilty of ſuicide, may be ſaved, we are extremely willing to hope, becauſe 'tis preſumed that nothing but a deprivation of reaſon could make a chriſtian guilty of ſuch an action; agreeable to which, is the favourable opinion our courts of juſtice entertain in ſuch caſe, where the perſon is generally brought in non compos mentis. And certainly people deprived of reaſon, will never be accountable for actions done contrary to it.

THAT they were denied chriſtian burial by the law, might be to deter others from ſuch actions, ſince laws of that nature have been always made in terrorem.

Query.

IS it poſſible for mankind to attain to perfection? if not, why ſays our Saviour, "Be ye therefore perfect, as your Father, which is in Heaven is perfect?"

Anſwer.

SURE man can never be ſo perfect as his Maker, ſince undeniable are thoſe words of Eliphaz, "Behold, he putteth no truſt in his ſaints; yea, the heavens are not clean in his ſight." When therefore, our bleſſed Lord commands to be perfect, as our Father, which is in Heaven is perfect, he propoſes God as a pattern of perfection, which we ſhould endeavour as accurately to imitate, as our frail mortality will permit. And while in this ſenſe we ſet the Lord always before us, we ſhall be daily provoked to make nearer advances to the ſtill diſtant object of our conſtant imitation.

Query.

WHETHER a man can properly be ſaid to take cold?

Anſwer.

HE may properly be ſaid ſo to do, becauſe the air being received in full draughts through the mouth into the Aſpera Arteria, Bronchia and Veſicles of air, belonging to the lungs, doth there encounter the blood, rendering it too thick, cold and clammy; whereupon, from the over-cooling of the blood, proceed coughs, catarrhs, &c.

Query.

HOW comes gaping to be catching?

Anſwer.

GAPING or yawning is infectious, becauſe the ſteams of the blood being ejected out of the mouth, doth infect the ambient air, which being received, by the noſtrils, into another man's mouth, doth irritate the fibres of the hypogaſtric muſcle to open the mouth to diſcharge by expiration, the unfortunate gueſt of air infected with the ſteams of blood as aforeſaid.

Query.

Query.

WHICH is moſt to the advantage of a general, to end a war glorioufly, or have it continued?

Anſwer.

THE word Advantage in the query, appears to be dreſt in an ambiguous mantle: If it is meant that ſordid intereſt which we diſtinguiſh by the name of gain, it is undoubtedly that way, the advantage of a general to continue the war as long as poſſible; but we believe, the queriſt would be ſatisfied if the glorious ending of a war is not more honourable to a general, than a continued bickering? And to this we anſwer in the affirmative. For if the war itſelf, be juſtifiable, it muſt certainly be the higheſt pitch of merit in a general, to watch every opportunity, and bravely ſcrew the fortunes of his country to the elevated height of an illuſtrious victory.

Query.

WHETHER it is not a ſin to ſay thoſe words in the marriage ceremony, "With my body I thee worſhip:" ſince it is promiſing in the ſight of God, to be guilty of idolatry?

Anſwer.

THERE are two ſorts of worſhip, a religious and a civil worſhip. And as the one ſignifies that homage, which we incommunicably pay to God; ſo the other implies that reſpect, which we pay to man. Hence ſeveral magiſtrates are ſtiled worſhipful. When the man therefore ſays to the woman, "I thee worſhip," he means no more than I thee honour.

Query.

PRAY how came crooked men by the title of my lord?

Anſwer.

AMONG ſeveral probable accounts of this cuſtom, the following appears moſt rational.

IN the firſt year of the reign of king Richard III. commonly known by the name of Crookt-back, ſix perſons, unhappily deformed in that part of their bodies, were made lords, as a reward for ſeveral ſervices they had formerly done the king; the novelty whereof, occaſioned the whole nation to make merry

merry with thoſe ſort of people, by adviſing them to go to court, and receive an honour which nature ſeemed to have deſigned them for: 'tis from this, we preſume, the mock title of my lord has been ever ſince, peculiar to ſuch perſons.

Query.

I HAVE read in Jude, that Michael contended with the devil about the body of Moſes. Pray inform me of the reaſon of their diſpute?

Anſwer.

It is the opinion of ſome, that Moſes was tranſlated, like Elijah, into Heaven, and that the devil contended with Michael, that he ought not to be thus tranſlated, in that he had been guilty of murder, in ſlaying the Egyptian. But as Moſes' tranſlation has no other dependance than Jewiſh tradition, it is contrary to Deuteronomy xxxiv. 5. 6. "So Moſes, the ſervant of the Lord, died in the land of Moab, according to the word of the Lord. And he buried him in a valley, in the land of Moab." But ſince it immediately follows, no man knoweth of his ſepulchre to this day; and the reaſon why his ſepulchre was hid, was probably, leſt the Jews (a people exceedingly prone to idolatry) ſhould worſhip the body of ſo renowned a law-giver, we may therefore not unreaſonably ſuppoſe, that the devil would have diſcovered the concealed ſepulchre, but was prevented by the arch-angel Michael, whence might ariſe that memorable contention mentioned by St. Jude.

Query.

WHICH is the moſt noble employment of a rational being, love or friendſhip?

Anſwer.

Friendship certainly is the moſt noble employment of a rational ſoul. Love ſeems only the diverſion of the mind, but friendſhip is its buſineſs. The firſt, in ſome meaſure, leſſens the dignity of human nature; the latter raiſes and ennobles it, even to ſimilitude of the Deity himſelf, for it gives us a taſte of thoſe joys which are only to be found in his preſence, namely, a mutual deſire of pleaſing and raiſing the felicity of each other. But we ought to ſpend no time in the

the proof of this, if we did but rightly conſider, that friendſhip is the child of reaſon, love but the fondling of the paſſions.

Query.

WHAT is the cauſe of little white ſpots, which ſometimes grow under the nails of the fingers? and what is the reaſon they ſay they are gifts?

Anſwer.

THOSE little ſpots are from white glittering particles, which are mixed with red in the blood, and happen to remain there ſome time. The reaſon of their being call'd gifts, is as wiſe a one as that of letters, winding-ſheets, &c. in the candle.

Query.

WHETHER in admiring and meditating the lives, hiſtories, humours, and ſayings of men, the moſt excellent, we do not run the hazard of loſing our own natural advantages? For thinking to accord our humours to other mens examples, we forget or ſlight all that is our own, and ſcarcely ever do the other with a good grace.

Query.

THERE is ſcarce an excellence but what muſt be guarded with warineſs and caution. And therefore as imitation is excellent in its kind, ſo it muſt be managed with wonderful circumſpection. Too nearly to copy after the ſayings of other perſons is to be parrots, and not men; to accommodate ourſelves to their humours in the groſs, is to ape, and not imitate. When therefore we ſet before us the moſt eminent examples, we muſt not be a ſervile herd, as the poet expreſſes it; we muſt ſeparate the ore from the droſs; we muſt not ſuffer any coin to be current among us, merely becauſe it bears the image of the perſon we admire; in the moſt excellent of men, we muſt diſtinguiſh between their virtues and vices, their excellencies and defects; we muſt weigh the difference of conditions, of geniuſſes, of times, of places, and thoſe other accidental circumſtances, which may entirely alter the nature of an action. We muſt endeavour accurately to know ourſelves, that we may be thoroughly ſenſible, whether that be not aukward in us, which is graceful in another. But, above all, we muſt not over-look

over-look our own talents, but muſt exert our faculties in refining, in improving, in inventing. And if we thus prudently direct our imitation, we ſhall make good that common ſimile, of a dwarf ſet upon a giant's ſhoulder.

Query.

SOME mens ſpirits are viſibly maſters over thoſe of others. The queſtion is, Whether this does proceed from the excellency of education, or mens diverſity of fortunes, or the real priority of ſouls?

Anſwer.

WHAT propriety there is in the innate faculty of ſouls, human reaſon is incapable of judging; ſince whether thoſe faculties be equal or unequal, a difference in the actual exertion of them may ariſe from the cauſes you have mentioned, to which we may prefix another.

1. THAT the natural contextures of our bodies may cauſe no inconſiderable difference in the actings of our ſouls, is undeniably evident from undoubted inſtances. The capacities of ſome have been wonderfully impaired by accidental alterations in their bodies; and there have not been wanting thoſe, who, though of very eminent endowments, have yet, by ſome acute diſtemper, been unhappily reduced below the very level of common men. And this is further proved from the different geniuſſes in different countries, according to the difference in the nature of the climates.

2. THE difference ariſing from education is ſo very palpable, that we need not inſiſt upon it. Some men, who for natural abilities were once looked upon as of a common ſize, have, by induſtrious application, and the beſt opportunities of improvement, arrived to a quickneſs of underſtanding, and been in great eſteem, not only for their ſtudied acquirements, but alſo for the uncommon reach of their great capacities.

3. THAT the difference may ariſe alſo from the diverſity of mens fortunes, we have a noted inſtance in the poet Ovid, who juſtly attributes the want of that ſprightlineſs of thought, he had formerly been maſter of, ſo conſpicuous in his laſt compoſures, to his very unhappy circumſtances, which ſtrangely enfeebles the natural vigour of aſpiring ſouls.

Query.

Query.

IS it not better never to contract a friendſhip, than to break it; and if the uneaſineſs of the loſs of a friend be not greater than the ſatisfaction we find in having a friend.

Anſwer.

FRIENDSHIP ſeems to be the ſupremeſt felicity of the ſoul, as to the converſation in this life, and, conſequently, the pleaſures which ariſe from it are above expreſſion, where it is ſincere, and placed on a deſerving object: the breaking ſuch a friendſhip, therefore, muſt be the greateſt uneaſineſs that can happen to any perſon. But as we ought never to take up a friendſhip, without the greateſt conſideration, and perfect knowledge of one another, ſo ought we never to break it, unleſs the greateſt defects appear in the object; for the breaking ſuch a friendſhip gives us a double wound, in depriving us of the good offices we expected from a friend, and arraigning our judgment which made ſo ill a choice. Therefore, the uneaſineſs of thoſe reflections muſt be greater than the ſatisfaction which ſuch friendſhip could bring us.

Query.

WHY is it, when the mind is oppreſſed with extreme ſorrow, it often inclines the afflicted perſon to ſleep; whereas the vital parts being depreſſed, it ſhould rather obſtruct ſo peaceful an exerciſe?

Anſwer.

EXTREME ſorrow has uſually the contrary effect. But as it muſt be allowed, that it ſometimes has the effect you mention, to theſe different effects ariſe from the difference in the conſtitution. For as ſleep is generally owing to the want of ſuch a quantity of animal ſpirits, as are ſufficient to diſtend the nerves, ſo in moſt conſtitutions extreme ſorrow ſo irritates the blood, as to ſupply the nerves with a large ſtore of animal ſpirits, whence conſequently proceeds watchfulneſs. But in ſome conſtitutions the ſame degree of ſorrow has a greater influence on the nerves to diſſipate the animal ſpirits, than on the blood to occaſion proportionable ſupplies. But as our bodies are not at all times alike affected, ſo the ſame cauſe may produce different effects in the very ſame perſon at different times.

Query.

Query.

I HAVE been taught, that if the product of any two factors be divided by either of thoſe factors, the quotient will be the other. Now if 2 is multiplied into 0, the product will be 0, therefore 0 being divided by 0, the quotient, which ſeems abſurd, will be 2. Again, if infinite be multiplied by 2, the product will be infinite; therefore infinite being divided by infinite, the quotient will be 2, which ſeems as abſurd as the other; pray be ſo kind as to explain this to me?

Anſwer.

You have explained it yourſelf very well, at leaſt you have proved that it muſt of neceſſity be ſo, for when the two premiſes of an argument are true, the concluſion muſt alſo be true; yet as there is ſome difference between knowing that a thing is true, and having a clear idea of the truth of it, we will try whether we can ſo explain it, as to make you conceive it clearly. Be pleaſed therefore to obſerve, that 0 is the term from which all quantities begin; now imagine that two mobiles ſet out from the ſame term, and that one of them moves with a velocity double to that with which the ſecond moves, it is certain, that in all the inſtants of time, that which moves with a double velocity, has deſcribed the double ſpace of the other; therefore conſider what has happened in one minnte, and in half a minute, then in a quarter of a minute, and ſo on, till you come to the very inſtant of the beginning, you will have two progreſſions, whereof each term of one will be double to each correſponding term of the other; therefore the very beginning of one is double to the beginning of the other, that is, 0 in one caſe is double to 0 in the other; now if 0 may be double to 0, it is no abſurdity that 0 divided by 0 is equal to 2; likewiſe, if the proportion be conſidered the other way, it is evident, that one infinite will be double to the other, therefore it is no abſurdity, that infinite divided by infinite, is equal to 2.

Query.

WHETHER we are not obliged to ſtand, when we praiſe God; or to be in a ſtanding poſture, when we ſing pſalms, eſpecially ſince many of the pſalms uſually ſung contain expreſſions of prayer and praiſe; and it being likewiſe the cuſtom

to riſe and ſtand, when we ſing, Gloria Patri? And further, whether ſtanding at ſinging was not cuſtomary in the primitive times?

Anſwer.

In what manner ſoever we are praiſing God, ſtanding no doubt is the moſt agreeable poſture. And therefore we ſuppoſe the cuſtom of ſitting, when the pſalms are ſung, to have proceeded from careleſſneſs and inadvertency. Though yet there are many pious and conſiderate Chriſtians, who always ſtand at ſo divine an exerciſe. And this poſture is punctually obſerved at St. Peter's, Cornhill, introduced, as we imagine, by the late pious Biſhop of St. Aſaph And that the ſame poſture obtained among the primitive Chriſtians we have no reaſon to doubt, ſince they were uſed to ſtand at a leſs devotional employment.

Query.

WHAT natural cauſe do we aſſign to that ſtrange diſturbance in the ſleep, which occaſions perſons to walk, and perform in many caſes, as if awake?

Anſwer.

The animal ſpirits running through ſuch paſſages of the brain, as they find open to their admiſſion, and conſequently, through the ſame paſſages, they were uſed to paſs, excite, ſimilar ſenſations in the ſoul, which diſpoſes us to ſuch actions in our ſleep, as while awake, we were accuſtomed to perform.

Query.

WHAT is the ſin againſt the Holy Ghoſt; it being mentioned, but not told what it is?

Anſwer.

We cannot ſay, that we are not acquainted with the nature of this unpardonable ſin; ſince the context gives us ſo clear a light into it. The Phariſees had maliciouſly and obſtinately aſcribed that wonderful power of God's holy ſpirit, whereby our Lord was enabled to caſt out devils, to an impure, to an infernal agency. As therefore he reproves their inexcuſable wickedneſs, ſo alſo he denounces an irreverſible puniſhment. Does it not therefore plainly and naturally follow, from the

common modes of ſpeech, that ſo terrible a denunciation has a particular regard to that ſin, that virulent ſin of the Phariſees, which gave occaſion to it, but ſince after this our bleſſed Lord vouchſafed to promiſe the ſame delinquents that important ſign of his reſurrection from the dead; ſince upon the croſs he condeſcended to implore their pardon at his father's hands; ſince we read, that the Holy Ghoſt was not yet given, that is, the public diſpenſation of that bleſſed Spirit which was not then commenced; ſince St. Peter, in ſome meaſure excuſed their condemning the Lord of life; therefore ſome learned and judicious divines have not irrationally concluded, that the unpardonableneſs of thus blaſpheming the Holy Spirit, was not to take place till the day of Pentecoſt, till that ſignal time, when God ſet, as it were his laſt ſeal to the doctrine of his beloved Son, in whom he was well pleaſed.

Query.

IN Gen. 1. we find that beaſts were made before men; in Gen. 2. man ſeems to have been made before beaſts. Your reconciliation of the matter?

Anſwer.

THE ſacred hiſtorian obſerves the order of time in chapter 1. but treats of things more promiſcuouſly in the 2d. When therefore it is ſaid, at verſe 19. "Out of the ground the Lord formed every beaſt, &c. and brought them unto Adam," the meaning is, that he firſt formed every beaſt, and after that Adam was created, brought them to him.

Query.

WHERE is Hell ſituated?

Anſwer.

THE ſituation of Hell, or as it is called, a local hell, may juſtly be numbered among the ſecrets of Providence, which are undiſcoverable by man.

Query.

DOES the puniſhment of Hell conſiſt of a real fire, or of only the privation of the ſight of God?

Anſwer.

Anſwer.

THOUGH it ſhould not conſiſt of a real fire, it will yet be more than a bare privation of the ſight of God. For a conſciouſneſs of ſin (however for a ſeaſon it may be lulled aſleep) is naturally and irreſpectively a very exquiſite tormentor.—But though we cannot be poſitively aſſured, that the holy penmen intend any more by the mention they make of fire, than to repreſent the torments of Hell under the moſt terrible reſemblances (when yet they may infinitely exceed the images made uſe of) ſo neither can we ſay, that their expreſſions are not literally to be underſtood, ſince our bodies, as well as our ſouls, will be grevioufly tormented, which may be ſo ordered by Omnipotent diſpleaſure, as to be always burning and yet never burnt.

Paradox.

I DID exiſt, and ever ſhall
But now I don't exiſt at all.

Anſwer.

THE * inſtant that we preſent call,
Did once exiſt, now, not at all.

Query.

SUPPOSE one eye to be diſpoſed as to repreſent a man with his heels upwards, and that of the other to remain in its true poſture, I aſk, what idea would an intent looking on the man with both eyes frame in my mind?

Anſwer.

THE eye that would repreſent the man with his heels upwards, would, or would not, be ſo diſpoſed, as to have the fibres of its optic nerve ſo correſpondent to the fibres of the optic nerve of the other eye, as that an object repreſented by both may produce but one image in the brain. If the latter, you would behold a duplicate of the ſingle object; the one in a right poſture, the other in an inverted one. That the object would be repreſented double, we learn from common obſervation. For when we ſo preſs one eye, as that the rays emitted

 from

* The leaſt preſent part of time, flowing equally and continually, being gone, with other indefinite ſucceſſions, before we can conſider it.

from an object, fall not on the correſpondent fibres, each eye diſtinctly and ſeparately exhibits the image of it to the perceptive faculty. If the former be ſuppoſed, the object would be repreſented to us in ſo indiſtinct and confuſed a manner, that we ſhould be at a loſs to know, what to make of it.

Query.

WHAT is the reaſon that infants, hardly a week old, ſmile, no human object being, in meo judicio, capable to induce ſo merry a humour?

Anſwer.

SMILES ariſe not always from an impreſſion made on the mind by outward objects, but ſometimes from internal cauſes, viz. from a perfect ſtate of health, &c. which diſpoſeth the mind to alacrity, of which ſmiles are one effect, and may the rather be expected from children, not only from their never having ſuffered under any indiſpoſition, but alſo from their not being ſenſible of the troubles of human life, to allay their natural alacrity.

Query.

PRAY, your reaſon, why a cat when ſhe falls, or is thrown from a houſe top, or any other place, always alights directly upon her feet?

Anſwer.

THEY are commonly, but not always obſerved to light on their feet; and it is chiefly due to their tail, which they fan the air withal, whereby the ſwiftneſs of their deſcent is ſo far retarded that they are enabled to prepare themſelves in ſuch a manner for their fall.

Query.

WHY religion ſhould make people ill-natured, and perſecute one another; or whether it has not been the occaſion of moſt of the barbarities in the world?

Anſwer.

THAT religion has been the occaſion of the moſt barbarous and inhuman practices, both the Heathen and the Chriſtian world afford us undoubted teſtimonies. That Paganiſm ſhould oblige

oblige its proſelytes to ſo cruel a behaviour, we muſt forbear to wonder, ſince the great deſtroyer, the grand adverſary of mankind was the object of their worſhip; but if it be enquired, (as we ſuppoſe it is by the Queriſt) why the profeſſors of chriſtianity, though the Prince of Peace, though that great preſerver of men, be the author and finiſher of their faith, ſhould yet be guilty of ſuch barbarous proceedings, as though their maſter came to deſtroy, and not to ſave mens lives; to this enquiry we ſubjoin a very noted axiom—The beſt things, when corrupted, become the worſt.

Query.

THE godfathers and godmothers, when an infant is baptized by a miniſter of the church of England, ſolemnly promiſe and vow to God, in the name of the ſaid child, or infant, that he or ſhe ſhall live, and be perfect from ſin all the days of its life. I think the ordinance of baptiſm imports thus much, yet the members of the ſaid church, generally, in diſcourſe, argue againſt perfection, without, at, or near the point of death?

Anſwer.

THE godfathers and godmothers do no where, in the office of baptiſm, promiſe for the infant, a perfect, an un-ſinning obedience. 'Tis true, indeed, they promiſe, that the child ſhall conform to that, which if accurately and punctually conform'd to, it will not fall ſhort of abſolute perfection. But then this conformity, they promiſe, is to take its eſtimation from the meaſures of ſincerity, and not from the ſtandard of perfection; that is, they promiſe in the child's name, that it ſhall ſincerely endeavour to comply with the whole law of God, as far as frail mortality will permit. The promiſe therefore of godfathers and godmothers is to be taken in the ſame ſenſe with that excellent petition in the Lord's Prayer, "Thy will be done on earth, as it is in heaven." For it is not ſuppoſeable, that men can be as perfect as angels; men encompaſſed with duſt and aſhes, as perfect as thoſe diſencumbered, thoſe unbodied ſpirits. When therefore we put up that addreſs to the throne of grace, we no more than implore our Heavenly Father, that he would enable us to come as near to thoſe pure, to thoſe ſpotleſs beings, as the neceſſary condition of our mortality will admit.

Query.

WHY do we throw cold water in a man's face when he ſwooneth?

Anſwer.

COLD water thrown into the face, cauſes a contraction of the pores, ſurprizes the ſpirits, recalls them to their wonted emanations, and reſtores the blood to its due circulation.

Query.

SAY, Britiſh youths, who with exalted heads,
Setting next Pinda on ſublime Parnaſſus,
Receive the laurels due to your great worth.
Why does the ſwelling Nile, thro' fertile plains,
Which runs tumultuous, overflow its banks?
And with its fat'ning ſlime rejoice the ſwain,
Who with his ſharp'ned ſickle comes to reap
A golden harveſt; part, fruit of his care,
And partly caus'd by th' overflowing tide?

Anſwer.

WHEN the warm ſun from Æthiopian lands,
Remits the fervour, and bids winter reign,
Succeſſive ſhow'rs o'er diſtant mountains ſmoke,
And falling thence, in rapid torrents roll,
Tearing, as thro' the delug'd lands they fly,
The muddy bottom of up-rooted earth,
And thick'ning with fat ſoil their growing ſtreams:
Hence 'tis, that cov'ring with rich ſlime a ground,
Which the hot ſun had burnt to ſand before,
Ægyptian plenty does with Nilus flow,
And by his fall, ſoon feels a ſure decreaſe.

Query.

WHY does a drunken man ſee double?

Anſwer.

THE fumes of the liquor, he is intoxicated with, may be ſuppoſed ſo to diſorder his eyes, as that the repreſentation of the object cannot fall upon the correſpondent fibres of the optic nerves. Whence it becomes impoſſible, that the two-

fold

fold image exhibited by the two eyes ſhould ever ſo unite, as to produce but one reſemblance in the brain.

Query.

I DESIRE you will pleaſe to let me know, what ſex the devil is of?

Anſwer.

By his roughneſs one would take him to be of the maſculine gender, but ſince he ſo often appears in petticoats, we have more reaſon to believe him a hermaphrodite.

Query.

WHY doth a dog ſweat only on the tongue, and not on the ſkin?

Anſwer.

Our opinion then is, that the dog's tongue doth not ſweat, but we rather ſuppoſe the humour dropping from it in their pantings, to be ſaliva: And that the natural conſtriction, or ſtraitneſs of their pores, prevents the perſpiration of humours through their ſkins.

Query.

WHY thunder turns beer, ale, &c. ſour; and whether iron preſerves or not?

Anſwer.

Thunder is apt to turn beer, ale, &c. ſour, by the violent agitation and new fermentation it cauſeth in thoſe liquors, by which their ſpirituous parts are in a great meaſure diſſipated or depreſſed, and their tartarous parts exhaled. Several grounded, as they pretend, upon experience, will affirm, that iron hath that peculiar property to prevent that effect; but others will tell you, that it does it only by reaſon of its weight and preſſure upon the veſſel, and that any other ponderous body will have the ſame virtue; which laſt opinion ſeems more probable than the firſt, and may be confirmed only by repeated experiments.

Query.

Query.

WHY is the nine of diamonds called the curſe of Scotland?

Anſwer.

DIAMONDS, as the ornamental jewels of a regal crown, imply no more in the above-named proverb than a mark of royalty, for Scotland's kings for many ages, were obſerved, each ninth to be a tyrant, who by civil wars, and all the fatal conſequences of inteſtine diſcord, plunging the divided kingdom into ſtrange diſorders, gave occaſion, in the courſe of time, to form the proverb.

Query.

FROM whence derived the origin of the word Dun?

Anſwer.

SOME falſely think it comes from French, where donnez, ſignifies give me, implying a demand of ſomething due; but the true origin of this expreſſion owes its birth to one Joe Dun, a famous bailiff of the town of Lincoln, ſo extremely active, and ſo dexterous at the management of his rough buſineſs, that it became a proverb, when a man refuſed to pay his debts, 'Why don't you dun him?' That is, why don't you ſend Dun to arreſt him; hence it grew a cuſtom, and is now as old as ſince the days of king Henry VII.

Query.

WHY fiſh, though bred in Salt water, are yet freſh?

Anſwer.

THE ſolution of the queſtion naturally follows from the neceſſary allowance of theſe undeniable propoſitions. 1. That the whole body receives its nouriſhment from the blood. 2. That the nutriment, we take in, cannot be ſecreted into the blood, till rarified by the heat of the ſtomach. And 3. That ſalt is incapable of ſuch a rarefaction.

Query.

WHETHER water, if drank from youth, would not be more agreeable to man, than any artificial liquors?

Anſwer.

Anſwer.

The drinking of water may be beneficial to ſome conſtitutions, but deſtructive to others; and more eſpecially to thoſe who inhabit cold countries. Nor do we find it agreeable in the hotteſt countries, for there the tranſpirations are ſo great, that the ſtrongeſt liquors are ſcarcely powerful enough to ſupply the great expence of ſpirits.

Query.

ACKNOWLEDGING that all dealings with the devil is abominably ſinful, I deſire to know, whether it is lawful to apply to thoſe who profeſs fortune-telling.

Anſwer.

As the having recourſe to ſuch pretenders is too epidemical a diſtemper, ſo the ſolution of the queſtion may be of public utility. But we may draw a very cogent argument againſt it, from your own acknowledgments; for, what aſſurance can you have, that the perſons you apply to have no dealings with infernal ſpirits? And if they themſelves imagine, that they have nothing to do with them, yet you know not, but thoſe ſubtle agents may have intercourſe with them, as it were incognito, and influence their proceedings, though unknown to them. To this purpoſe we would preſent you with an authentic ſtory. A gentleman uſed to buſy himſelf that way, and from the ſchemes he had drawn, foretold ſeveral events; but peruſing his ſchemes afterwards, and finding them notoriouſly falſe, he was ſtrangely ſurpriſed that true conſequences ſhould follow from ſuch fallacious premiſes. Whence, fearing the concurrence of an infernal agency, he wiſely bid adieu to that ſuſpected art.

But let us ſuppoſe nothing in the caſe but the rules of art; what art or ſcience can acquaint us with the deſigns of Providence, with the intention of our all-wiſe diſpoſer? What reſearches can make us know the mind of the Lord—can qualify us to become his counſellors? And could human learning enable us to perform ſuch wonders, what warrant have we to dive into the ſecrets of the Almighty, to invade our ſovereign's prerogative, and boldly intrude upon thoſe things, which the Father hath reſerved in his own breaſt, and you know withal, who has ſaid, "It is not for you to know the times and ſeaſons—take no thought for the morrow, for the morrow ſhall take

take thought for the things of itſelf; ſufficient for the day is the evil thereof." And the ſame divine perſon is ſo far from allowing you to pry into futurity, that he commands you to pray only for your daily bread. And ſince God has forbid you the deſire of knowing what ſhall be hereafter, you may well conclude, that it is beſt for you not to know it; and that ſuch knowledge, as it is too wonderful for you, ſo alſo it is ſuch as you cannot, without prejudice to yourſelf, attain to.

UNDER ſo unlawful a pretenſion we may include palmiſtry, phyſiognomiſtry, &c. with the unwarrantable proceedings on St. Agnes' and other days, which are the unchriſtian relicts of Heatheniſh ſuperſtition. Let therefore this uſeful ſentence reſtrain ſo unjuſtifiable a practice,—Commit your way unto the Lord, and he ſhall bring it to paſs.

Query.

WHAT occaſions that numbneſs, and pricking pain, which ſometimes happens in the hands and feet, (commonly called their limbs aſleep) whereby the parts ſo affected are for ſome time rendered incapable of feeling or motion?

Anſwer.

THAT numbneſs, or pricking pain, generally follows the compreſſion, or conſtriction of the parts ſo affected, whereby the courſe of the animal ſpirits through the nerves is obſtructed, and conſequently the ſenſe of feeling in a great meaſure diminiſhed.

Query.

IS a man, in point of conſcience, obliged to marry a woman whoſe affection he hath gained, if her father will not give her the fortune he hath promiſed, as 'tis evident he will not in the caſe of your humble Queriſt, who deſires to know, whether the breach of his promiſe doth not diſengage me of mine, the one being ſo much the cauſe of the other, that without it, it had never been?

Anſwer.

IF your contract was conditional, undoubtedly the lady's father, breaking his part of the obligation, muſt of courſe diſſolve your own; but if your circumſtances will conveniently allow it, it would be but an act of honour and generoſity

roſity to marry, notwithſtanding that, the object of your former courtſhip; for we find by your confeſſion, you have gained her love, and in obtaining that, we muſt believe you have made other proteſtations, than that you valued her for what ſhe was to bring you.

Query.

IS there a paſſage from the noſe to the brain, by which the brain may be injured by taking of ſnuff?

Anſwer.

THAT there are paſſages from the brain to the noſtrils is moſt certain, viz. the perforations of the Os Cribroſum, through which the nervous fibres deſcend, but they are ſo ſmall that ſnuff powder cannot be intermitted, or aſcend through them to the brain. Yet may the overmuch uſe of ſuch powders ſo fur and clog that bone, that the diſcharge of excrementatious humours may be hindered, and the brain conſequently very much injured thereby.

Query.

FROM whence did that ſaying ariſe, of nine taylors making a man?

Anſwer.

IT happened (it is no great matter in what year) that eight taylors having finiſhed conſiderable pieces of work, at a certain perſon of quality's houſe, (whoſe name authors have thought fit to conceal) and receiving all the money due for the ſame, a Virago ſervant maid of the houſe, obſerving them to be but ſlender built animals, and in their mathematical poſtures on their ſhop-board, appearing but ſo many pieces of men, reſolved to encounter and pillage them on the road. The better to compaſs her deſign, ſhe procured a terrible great black-pudding, which, (having way-laid them) ſhe preſented at the breaſt of the foremoſt; they miſtaking this prop of life for an inſtrument of death, at leaſt for a blunderbuſs, readily yielded up their money; but ſhe not contented with that, ſeverely diſciplined them with a cudgel ſhe carried in the other hand, all which they bore with a philoſophical reſignation. Thus, eight not being able to deal with one woman, by conſequence, could not make a man, on which account a ninth is added.

It

It is the opinion of our curious virtuoſo's, that this want of courage ariſeth from their immoderate eating of cucumbers, which too much refrigerates their blood. However, to their eternal honour be it ſpoke, they have been often known to encounter a ſort of cannibals, to whoſe aſſaults they are often ſubject, not fictious, but real man eaters, and that with a lance, but two inches long, nay, and although they go armed no farther than their middle finger.

Query.

WHETHER the ſun goes round the earth, and the earth ſtands ſtill; or whether they both move, and how they move?

Anſwer.

We agree with the beſt modern aſtronomers, that the ſun is an immovable centre, round which the planets (of which the earth is one) move by different revolutions. But the figure, which the earth annually deſcribes, is not circular, but elliptical; which is the reaſon why ſhe does not continue equidiſtant from the ſun. But as once a year ſhe travels round the ſun, ſo in the compaſs of 24 hours ſhe moves round her own axis; whence ariſe the alternate ſucceſſions of night and day.

Query.

WHY do we ſleep better on the right ſide, than on the left?

Anſwer.

Your ſleeping better on the right ſide than on the left, is no general rule; ſince ſome ſleep as well or better on the left than on the right, it being chiefly owing to cuſtom: But if you aſk why 'tis more wholeſome to ſleep on the right ſide, it may be anſwered, that ſuch a poſture is moſt convenient for the paſſage of the chyle through the pylorus, or nether orifice of the ſtomach, into the guts and clyliferous veſſels, and conſequently moſt proper for digeſtion.

Query, by a Lady.

WHAT benefit doth one receive by kiſſing? and who was the inventor of it?

Anſwer.

Anſwer.

AH! Madam, if you had ever had a lover, you would not have required a ſolution, ſince there is no diſpute but the kiſſes of a mutual lover give infinite ſatisfaction and pleaſure, above deſcription. As to the inventor of it, 'tis certain nature was its author, and that it began with the firſt courtſhip.

Query.

WHENCE aroſe the cuſtom of drinking healths? and why is the King's drank before the church?

Anſwer.

THE drinking of healths, probably, took its riſe from the time of the Danes in this iſland; it being cuſtomary with the Danes, whilſt an Engliſhman was drinking, to take that opportunity of ſtabbing him. The Engliſh, upon this, entered into combination, to be mutual pledges of ſecurity for each other whilſt drinking, ſo drank to each other's health and preſervation. From thence alſo came the cuſtom of pledging. The King being head of the church, his health claims precedence.

Query.

WHAT are the excellencies and prejudices of Coffee?

Anſwer.

COFFEE is a very great deſiccative, it comforts the brain, dries up crudities in the ſtomach, and through its alcalious property, is wonderfully beneficial in ſcrophulous and ſcorbutical habits of body. Nor can we omit its inconveniences in reſpect to ſome particular conſtitutions, as being ſubject to fur the ſtomach, engender obſtructions, and to cauſe, rather than cure, (as ſome will have it) ſplenetical and hypochondriacal diſtempers.

Query.

WHY does tickling produce laughter?

Anſwer.

BECAUSE, when tangible impreſſions pleaſantly aſſault the fibres, the ſpirits implanted there are gathered together and

delighted: And this ſenſation is communicated by the nerves to the common ſenſory, whence the imagination and præcordia are in ſuch a manner affected.

Query.

WHAT is the cauſe of the Cramp?

Anſwer.

It is cauſed by the evil diſpoſition of the animal ſpirits, which being burthened with heterogeneous particles, and at length irritated, attempt an exploſion thereof, but being thick and viſcous, and conſequently more tenacious, are ſhut up within the fleſhy fibres, and the longer detained in the expanſion. Or it may be imputed to the conſtriction or ill conformation of the tendons, whereby the reflux of the ſpirits from the muſcular fibres is obſtructed.

Query.

WHENCE comes the Proverb, As drunk as David's Sow?

Anſwer.

David Lloyd, a Welſhman, kept an ale-houſe in the town of Hereford, and had a kind of monſtrous ſow, with ſix legs, which he ſhewed to cuſtomers, as a valuable rarity.

This David's wife would often uſe to make herſelf quite drunk, and then lie down to ſleep an hour or two, that ſhe might qualify herſelf for the performance of her buſineſs. But one day, the houſe was full, and ſhe could find no other place to ſleep in, but the hog-ſtye, where her huſband kept the ſow above named, on clean ſtraw, ſo ſhe very orderly went in and fell aſleep by her harmonious companion. But the ſow no ſooner found the door upon the jar, but out ſhe ſlipt, and rambled to a conſiderable diſtance from the yard, in joy for her deliverance.

David had that day ſome relations come to ſee him, who had been againſt his marrying, and to give them an opinion of his prudent choice, he took occaſion, to inform them, he was ſorry, that his wife was abroad, becauſe he would have had them ſeen her. "For," ſays David, "ſurely never man was better matched, or met with a more honeſt, ſober wife, than I am bleſt in."

They

THEY congratulated his good fortune, and were, after a ſhort time deſired by David, to ſee the greateſt wonder of a ſow, that ever had been heard of in the world. He led them to the hog-ſtye door, and opening it to its full wideneſs, the firſt thing they ſaw was his good wife in ſuch a poſture and condition, as upon her ſtarting up, and calling David huſband, gave occaſion for a hearty fit of laughter, and the proverb you have mentioned.

Query.

DOTH the law of God, or the law of this land forbid couſin germans to marry? if ſo, why is it ever allowed of? if not, why is it generally ſaid, that they never live happily and proſperouſly together?

Anſwer.

THE marriage of couſin germans comes not within the prohibition preſcribed us by our Engliſh laws. Nor can we ſay that it is forbid by a ſuperior power, ſince not included in the catalogue of unlawful marriages, and ſo fully repreſented in *Lev.* 18. As for the uſual ſaying, that ſuch marriages never proſper, ſince it is the vulgar opinion, that the nearneſs of the kindred ſhould forbid the banns, the notion therefore may proceed from hence, namely, that more notice may be taken of an unproſperous, than of a proſperous match. But however that be, this muſt be allowed, that the rule is not without exceptions. But after all, we think it more eligible to forbear, ſince, as it would be thought generous to pay a deference to ſo common an opinion, ſo it may be accounted diſcreetly done, not to venture upon the very firſt remove from ſo notorious an impiety as that of inceſt. And therefore, though we would not impoſe any reſtraint upon the couple ſpecified, we would yet acquaint them, that though, if they marry, they may do well, yet, if they forbear, they will do better. We therefore think it more adviſable, to refer the caſe to that apoſtolical aſſertion, "All things are lawful for me, but all things are not convenient."

Query.

WAS the Virgin Mary a perpetual virgin?

Answer.

THE argument drawn from that expreſſion, "Thy mother and thy brethren ſtand without, &c."—to diſprove her a perpetual virgin, carries no manner of conviction with it, ſince it was cuſtomary with the Jews, to repreſent near relations under the endearing ſtile of brethren. And yet, had there been no ſuch cuſtom, they might have been Joſeph's children by a former wife. If to this it be replied, that, as Joſeph was the elder line, ſo his children were nearer to the crown than Mary's, and conſequently her ſon could have no title to be king of the Jews, we anſwer, that God indeed made a ſure oath unto David, that his ſeed ſhould ſit upon his ſeat for ever, but never promiſed the ſucceſſion to the elder line. And this reply is the more confirmed, in that the ſon of David was to be a ſpiritual, not a temporal king; in that the prophecy, he ſhall have dominion alſo from ſea to ſea, was to be fulfilled in a myſtical intendment, agreeable to the profeſſion of that very Son of David, my kingdom is not of this world. And as this is a confutation alſo to that ſimilar objection, which may be ſtarted in defence of the other ſide, namely, that Joſeph never knew his wife, becauſe his children by her muſt have been preferred to the Bleſſed Jeſus, as, what has been already ſaid, is equally a confutation to this objection alſo; ſo we may conſider too, that Joſeph might have known his wife without any neceſſity of having children by her; that, if Mary would have naturally borne him children, yet ſince children are a gift, that cometh of the Lord, that God, to whom, as the Jews expreſs it, the key of the womb belongs, might have purpoſely reſtrained her natural fertility, and, as it were, have ſaid to the bleſſed Virgin, thus far, (namely to the birth of the Holy Jeſus) thus far ſhalt thou go, and no farther.

SOME alledge, that thoſe expreſſions, Joſeph knew her not, till ſhe had brought forth her firſt born ſon, plainly intimates, that he knew her afterwards. To which others (among whom is the excellent Biſhop Pearſon) make, as they think, a very clear reply, namely, that from parallel expreſſions in the ſcriptures it appears, that there is no neceſſity for ſuch an intimation. But we beg leave to obſerve, that in the various inſtances, they produce, there is not one parallel to the caſe before us. For if in them no ſuch intimation preſents itſelf, it is, becauſe there is an obvious, an apparent reaſon for it. To give you a ſpecimen.

In

In 1. *Sam.* 15. 35. we read, "And Samuel came no more to ſee Saul until the day of his death." Now, ſince the paſſage ſignifies, that Samuel came no more to ſee Saul, as long as he lived, there is a palpable reaſon, why it cannot be intimated, that he came to ſee him afterwards; namely, becauſe it was impoſſible he ſhould: whereas no impoſſibility can be alledged in Joſeph's caſe.

Our Lord, ſay ſome, is called the firſt born ſon of Mary; and the mention of a firſt (ſay they) implies a ſecond; but this objection is readily confuted by the ſcripture uſage of the phraſe, as may appear from *Exod.* 13. 2. "Sanctify to me all the firſt-born." For they, who had but one child, were from that command obliged to ſanctify him to God.

A learned man concludes it at leaſt improbable that Joſeph ſhould ſo long cohabit with his wife without the knowledge of her, ſince we no where read, that God had enjoined him ſo ſevere an abſtinence. But to this we anſwer, that we no where read, that Joſeph was commanded to abſtain, till ſhe had brought forth her firſt-born ſon. And therefore the argument proves too much, ſince it proves withal, that he did not abſtain, till ſhe had brought forth her firſt-born-ſon. And yet this is contrary to the text.

We need not wonder, that the ancients were of opinion, that Mary was a perpetual virgin, ſince they exalted virginity to ſo high a pitch. Nor that Origin was ſo ſtrenuous a defender of that opinion, ſince he ſo groſly miſapplied a ſentence of our Lord's concerning virginity. Nor that the Romaniſts are of the ſame mind with the ancients, ſince they look upon a marriage-ſtate as not ſufficiently pure for holy orders.

As we may be ready to conclude, that ſhe remained a virgin, while we conſider her high prerogative, as mother of our Lord, as having been overſhadowed by the Holy Ghoſt; ſo this conſideration is wonderfully enfeebled by theſe ſuggeſtions, namely, what ſhe was afterwards reflects nothing upon what ſhe was before; that marriage is honourable and the bed undefiled; that that holy ſtate is dignified with being an emblem of Chriſt's union with the church.

And thus we have thought it proper to examine the arguments on both ſides, and propoſe the objections, they are liable to, rather than determine the matter in debate, as thinking it beſt to follow the great St. Baſil's advice, and leave ſo contro-

verted a point ad huc ſub dudice, ſince it is of ſmall concern to the myſtery of the redemption.

Query.

MAY Pilate be accuſed of conſenting to the death of Chriſt?

Anſwer.

CAN we doubt of this, when the text expreſſly ſays, He delivered him to be crucified? 'Tis true, indeed, he pronounced him innocent, but therefore inexcuſable, ſince in the court of his own conſcience he muſt be thence empleaded, of knowingly, or wilfully ſhedding innocent blood. We cannot therefore ſufficiently admire at the prepoſterous behaviour of this unjuſt judge, who had the confidence to waſh his hands and declare himſelf guiltleſs of the very blood he was going to ſpill. But if the man was ſo ſtrangely ſtupid, (for it is of the nature of ſin to infatuate the ſinner) as that his heart condemned him not, God was greater than his heart, and knew all things. For vengeance overtook him with an unwelcome ſpeed: for Vitellius, governor of Syria, depoſed him from his government, and ſent him to Rome, to anſwer before Tiberius to the charges that were laid againſt him. And though Tiberius died before his arrival, yet the guilty wretch received not his pardon from the new emperor, but was baniſhed by Caligula to Vienna in Gaul; where being wearied out with the emperor's perſecutions, he became his own executioner, and diſpatched himſelf. As Judas had done the ſame before, ſo the betrayer and condemner of our Lord, in compenſation, as it were, both betrayed and condemned themſelves. He who delivered up the Son of God, rather than be ſuſpected as not a friend to Cæſar, found an enemy in himſelf, and in Cæſar too. That very method (O the wonders of an over-ruling Providence!) whereby it was his deſign to promote his welfare, became unfortunately, but juſtly, the occaſion of his falling.

"THEY, (ſays our Lord to Pilate) who delivered me unto thee, have the greater ſin." Whence we have at once Pilate's ſin plainly intimated to us, and are made acquainted too, that injuſtice, when proceeding from ſpite and malice, is more criminal, than when proceeding from any other cauſe. And this may ſure engage us to put away the old leaven, the leaven of malice and wickedneſs, the leaven of the Phariſees, (as our Saviour

Saviour calls it) of thoſe very Phariſees, who delivered Chriſt to Pilate; to put away that old leaven, and eat the unleavened bread of ſincerity and truth.

Query.

I DESIRE to know the meaning of the third Heaven, 2. *Cor.* xii. 2.

Anſwer.

THERE is a number frequently made uſe of to denote a ſuperiority of degrees. Thus ter fælix, thrice happy, ſignifies no more, than very happy. And therefore the third Heaven is deſigned by the apoſtle to expreſs the higheſt Heaven, the place, where the ſhechinah, or divine preſence, diſplays itſelf to the bleſſed angels. Not, that from hence we can gather any thing of the ſituation of Heaven, or a local Heaven, ſince this may be no more than a condeſcenſive accommodation to human capacity.

Query.

THE Chineſe give an account for 500 years (or thereabouts) before our bible. Now, if their account be true, our's muſt be falſe, which I am well ſatisfied in myſelf is not, but that won't do in argument; ſo I beg the favour of you to help me out.

Anſwer.

THE Divine Providence, for the confirmation of believers and the conviction of infidels, has ſo wiſely, (and give us leave to add) ſo mercifully, contrived the matter, that the Chineſe hiſtorians ſtand ſelf-condemned, and are confuted by themſelves. And this is obſervable in remarkable particulars.

1. THEY ſpeak of a memorable conjunction of the five planets in one of their ſigns, while the ſun and moon were alſo in conjunction, during the reign of their fifth monarch Chuenhio. Which obſervation a celebrated aſtronomer, by a nice calculation, has, without danger of being objected to, placed about 500 years later than the tenor of their relations does infer.

2. THEY ſay alſo, that in the time of their ſeventh emperor Yao, the winter ſolſtice was about fifty degrees from the place where it was a few years ago. Whence aſtronomers acquaint

us

us, that the phænomenon, (if the obſervation was accurately taken) muſt have neceſſarily occurred near the forementioned number of years later than as repreſented in their chronology,

We inſiſt not on the argument drawn from the common period of human life in the reigns of their early monarchs, ſince that depends upon a compariſon with ſcripture hiſtory, whereas we are confuting thoſe, who deny the authority of the bible. And indeed we have no occaſion for the argument, when furniſhed with two ſo indiſputable, as thoſe above.

To point out the original of the Chineſe miſtake, it is a more than probable hypotheſis, that they (as did alſo the Egyptians) reckoned ſome ancient Collateral princes in a ſucceſſive line. For there are remarkable paſſages in their hiſtories, that evince, not only, that this obſervation of a great chronologer has a probable foundation, but alſo, that it is impoſſible it ſhould be otherwiſe.

And now, ſince thoſe oppoſers of our accounts do yet plead for us, and our very enemies (though unwillingly, nay, perhaps unknowingly) are at peace with us, ſhall we not believe the ſcriptures with a ſteady, and unſhaken mind; and learn, for the time to come, not to be ſtartled at ſeeming difficulties.

Query.

DO Spirits ſee, or are they blind?

Anſwer.

They neither ſee, nor yet are blind. But then we muſt underſtand ſight as the natural effects of corporeal ſenſation. For ſpirits have undoubtedly ſomething analogous to it. But though we know little of immaterial ſubſtances, but by way of negation, yet we may form ſome imperfect idea concerning the object of the queſtion, from what metaphyſicians acquaint us of the ſenſation of ſeeing. For they tell us, (and that very rationally too) that the eye is but the inſtrument of ſight, whereas it is the ſoul that really ſees. But as that incomparable member is the vehicle by which embodied ſpirits enjoy the benefit of viſion, ſo in what manner unbodied ones enjoy the ſame benefit, we ſhall ever be at a loſs to know, till diſengaged from theſe fleſhy tabernacles.

Query.

Query.

WHY are the rocks on which Sir Cloudeſly, in return from his ſucceſsful expedition to Thoulon, was caſt away upon, commonly called the Biſhop and his Clerks?

Anſwer.

A FLEET of merchant ſhips in their return from Spain about two hundred years ago, were ſhipwrecked on thoſe fatal rocks, among whoſe miſerable numbers none were ſaved but three, Miles Biſhop, James and Henry Clark preſerved miraculouſly on a broken maſt; 'twas thence the ſcene of their misfortune took the name it bears at preſent, and has ever ſince that memorable accident, vulgarly been knoown by.

Query.

A. COMMITS a ſecret murder, for which he flew from juſtice, and in his exile comes acquainted with B. who in five or ſix years acquaintance, expreſſes great friendſhip to A. with ſignal and repeated obligations, till within this month, A. for a trifle highly diſobliges B. who is ſo enraged to find himſelf ſo affronted, proteſts that his miſdemeanor to B. ſhall coſt him his life, for that he will diſcover the reſidence of the ſaid A. to the relations of the deceaſed, ſo that A. may be brought to juſtice.

Now, the fact being true, and the relation alſo impartial, Whether it is a crime in B. to fulfil his proteſtations; and although it is coherent to the laws of the land, yet in the ſight of the Almighty, whether it may be proper for men to imagine it ipſo facto murder, ſince it is not done for the ſake of juſtice, but to ſacrifice A. to the reſentments of the other, of what nature and degree you think the crimes?

Anſwer.

SINCE the blood of a murdered perſon crieth unto God for vengeance, and unleſs pacified, defileth a land, our duty both to God and our country, lays on us an indinpenſible obligation to deteſt, if in our power, the inhuman actor. Were not B. previouſly obliged to make a diſcovery of A. his proteſtations could no way engage him to the purſuit of his revenge, ſince nothing can oblige us to an unwarrantable action. When Herod had raſhly ſworn to what involved him in no ſmall perplexity, he ſhould have feared, not his oath, as the murder of the

the innocent, and have penitently bewailed his raſhneſs, in that he had made perjury become neceſſary. The beſt, therefore, nay the only advice we can give B. is to repent of the proteſtations he has made with ſo wicked an intention, to diveſt himſelf of any revengeful thoughts, to put on the chriſtian towards his offending brother, and yet at the ſame time, by a neceſſary diſcovery, to offer him up a ſacrifice to his country, to his God. But if he refuſes to make this atonement for the deceaſed, he does, in a manner, repeat the language of the Jews,—His blood be upon me, and upon my children.

Query.

WHY is it common in our church, to ſit when a chapter is read out of any evangeliſt, and yet to ſtand when the goſpel for the day is read?

Anſwer.

It was the cuſtom in the primitive church, to ſtand when any thing was read out of the evangeliſts; and therefore it is remarked by an eccleſiaſtical hiſtorian, as an unprecedented thing in an Alexandrian biſhop, in that he uſed not to riſe at the reading of the goſpels. But why we riſe to the goſpel for the day, and not to the ſecond leſſon, we preſume to be, becauſe the former is introduced with "Glory be to thee, O Lord!" which as being an hymn of praiſe, is proper to be repeated in a ſtanding poſture.

Query.

I DESIRE to know, why the maſculine gender is generally ſaid to be the more worthy gender, notwithſtanding all or moſt virtues are of the feminine, by which man ſeems to have nothing to do with virtue?

Anſwer.

Though the virtues are of the feminine gender, yet men being, by their labours, ſtudies and applications, maſters of thoſe virtues, the maſculine gender is more worthy than the feminine; the poſſeſſor being more worthy than the poſſeſſed.

Query.

WHY have beaſts the faculty of moving their ears, and not men?

Anſwer.

Answer.

BECAUSE ſeveral beaſts have muſcles, conſtituted for that end, which men have not, and may be called erectors and depreſſors, which move the ears upwards and downwards, though ſome beaſts want them as well as men.

Query.

IN what reſpect is Noah called the eighth preacher of righteouſneſs, 2 Pet. 2. 5. ſeeing in the genealogy of the Patriarch, Gen. 5. he is reckoned the eleventh (incluſively?)

Anſwer.

As Noah is not the eleventh, but the tenth, in the genealogy you mention, ſo the ordinal eighth in St. Peter is joined to perſon, not to preacher of righteouſneſs; and relates to the number of thoſe who were ſaved in the ark, from periſhing in the deluge, as the text evidently ſhews. But becauſe the ſtyling of Noah the eighth perſon of thoſe that were reſcued from the flood, may ſeem to denote him the laſt of the eight, whereas he was the firſt; we muſt know, that the phraſe may always ſignify one in eight, or that Noah, with ſeven more, was ſaved from that common calamity,—a propriety of ſpeech to be found alſo in prophane authors.

Query.

WHY does a ſeed taken from a flower of one colour, produce a flower of various colours?

Anſwer.

THE diverſity of colours proceeding only from the different, either figure or poſition of thoſe particles, which conſtitute the ſurface of a body, by making a different reflection and refraction of the rays of light falling upon them, to produce a variety of colours in a flower, nothing more is requiſite, than that ſome alteration be made in the ſituation of thoſe parts, out of which its ſuperficies is compoſed; which may be eaſily effected, by ſome ſmall difference in its nutricious juice, or by the ambient air.

Query.

FROM whence rain firſt came?

Anſwer.

Anſwer.

THE rain firſt proceeds from the vapours attracted from the earth and waters, which meeting together, condenſe into clouds, and becoming at length too ponderous to be ſuſpended in the air, break, and ſhower down again upon the earth and waters.

Query.

WHETHER the howling of a dog under the chamber of a ſick perſon, is any prognoſtic of the mortality of the patient's diſeaſe? If ſo, how do you imagine thoſe creatures ſhould be ſenſible of it? The Queriſt was induced to give you this trouble by ſome very particular obſervations.

Anſwer.

WHETHER the dog's howling may be a fatal prognoſtic or no, we cannot determine, but 'tis probable, that out of a ſenſe of ſorrow for the ſickneſs or abſence of his maſter, or the like, that creature may be ſo diſturbed: An eminent inſtance whereof may be found in Dr. Lee's Nat. Hiſt. of a dog, that, during his maſter's illneſs, conſtantly attended him, and after the gentleman was expired, and his corpſe moved, the dog every moment entered the room, making a mournful and whining noiſe, and proſecuted his reſearches for ſeveral days, through all the rooms in the houſe, but in vain; then he retired into his kennel, where, refuſing all manner of ſuſtenance, he died. A greater ſenſe of ſorrow could not be ſhown by any creature whatever.

Query.

PRAY demonſtrate that rule in ſpecious arithmetic, that to take away an affirmative quantity, is to add a negative, and to, &c.

Anſwer.

AN affirmative quantity denotes the poſſeſſion of ſuch a ſum but a negative quantity implies the abſence of it, or a debt of ſuch a value. As therefore, when from my poſſeſſion of 100l. the poſſeſſion of 60l. is taken away, I am then worth 40l. ſo when to my poſſeſſion of 100l. is added a debt which I muſt pay of 60l. I am then worth the ſame 40l.

Query.

Query.

WHY ſprings in ſummer are more cold,
Than winter, pray the cauſe unfold?

Anſwer.

THOSE limpid ſtreams, retrieve their heats,
From earth's recluſe ſulphureous ſeats;
Which winter time preſerves retire,
And which in ſummer time perſpire.

Query.

WHY is an egg ſo hard to break the length way, and yet ſo eaſy the other?

Anſwer.

BECAUSE the two ends of the egg are ſo globular, that the ſtreſs of the preſſure declines towards the coheſion of its parts. Which is the reaſon why an arch will bear more weight than a flat.

Query.

I DESIRE your opinion of the following paſſage of ſcripture, Luke xxii. 36. "He that hath no ſword, let him buy one;" which ſeems to contradict the other paſſage in Matth. xxvi. 52. "They that take the ſword, ſhall periſh with the ſword?"

Anſwer.

As the latter ſhews us, that the true ſpirit of the goſpel is abhorrent of the leaſt tincture of revenge, productive of no other fruits than the peaceable fruits of righteouſneſs; ſo the former is a kind of emblematical command, which hieroglyphically, as it were, pre-ſignifies the terrible perſecutions that were approaching, ſo terrible indeed, that it would be neceſſary for the Chriſtian to purchaſe a ſword at the expence of his very garment, would his religion but permit the uſe of it.

Query.

WHETHER the invention of Gun-powder has done moſt good or hurt?

Anſwer.

MOST good undoubtedly. For as it is very uſeful on ſeveral accounts, without any miſchievous effects attending it; ſo in war itſelf, where it is moſt deſtructive, it is rather a preſerver than deſtroyer of men; ſince in our modern accounts, we meet not with ſuch proportional numbers ſlain in battle, as we read of in ancient hiſtories.

Query.

CONDESCEND, I beſeech you, to give me your opinion, Whether the violent paſſion of love, very ill-treated, does not, conſequently, turn to hatred?

Anſwer.

NOT conſequently, for it much oftener produces deſpair: but we ſee different effects of that ungovernable paſſion, according to the different conſtitutions of thoſe it ſeizes.

Query.

ADMIT a perſon to ſee any inacceſſible object ſituate acroſs a river not too far off, and wiſhing to know the exact diſtance thereof—Required by what means he may find the ſame; he having no inſtrument, uſual for that purpoſe, at that time about him.

Anſwer.

THE line to be meaſured muſt not be extravagantly long, otherwiſe 'twill be hard to meaſure it exactly; for the leaſt failure of a juſt aim, or departure from an upright poſition, would make very ſenſible errors in the meaſure of a very long line, eſpecially if the ground is ſomewhat uneven.

To meaſure then the line A B (Plate VI. Fig. 5.) acceſſible at the extremity A, ſuppoſe the breadth of a ſmall river, he who pretends to meaſure, muſt ſtand very ſtrait at the extremity A, and ſupport his chin with a little ſtick, reſting upon one of the buttons of his coat, ſo as to keep his head ſteady in one poſition. Thus poſited, he muſt pull his hat down upon his forehead, till the brim of his hat cover from his view the inacceſſible extremity B of the line to be meaſured A B; then he muſt turn himſelf to a level uniform piece of ground, and with the ſame poſition of his hat obſerve the point of the ground

ground where his view terminates, as C; then measuring with a line or chain the distance A C, he has the length of the line proposed, A B.

Query.

THE genuine sense of Gen. vi. 2. "The sons of God saw the daughters of men, and that they were fair, and they took wives of all which they chose."

Answer.

THE sons of God were the children of Seth, who were the holy seed; and the sons of men, were the posterity of Cain, who were a prophane generation.

APPENDIX.

OPTICS.

THERE being ſeveral things in Optics *which are eaſy to be underſtood and not generally known; we ſhall here add a few, and firſt of all the*

DEFINITIONS.

1. WHATEVER grants a paſſage to light is called a medium.

2. By rays of light is underſtood its leaſt parts, either ſucceſſive in the ſame lines, or cotemporary in ſeveral lines.

It is clear that light conſiſts of parts both ſucceſſive and cotemporary, becauſe in the ſame place you may ſtop that which comes one moment, and let paſs that which comes immediately after. The leaſt ſenſible part which may be ſtopped, or ſuffered to proceed, is called a ray of light.

3. *Refrangibility* is that diſpoſition of a ray of light to be refracted, or turned out of its courſe, when it paſſes out of one medium into another.

When a ray of light paſſes out of a rarer medium into a denſer, Sir I. NEWTON ſuppoſes that it is refracted by the ſuperior attraction of the denſer medium, and by that means drawn out of its courſe.

4. *Reflexibility*

4. *Reflexibility* is that diſpoſition of a ray of light to be reflected, or turned back into the ſame medium from any other medium upon whoſe ſurface it may fall.

Sir I. NEWTON ſuppoſes that light is not reflected by impinging upon the ſolid parts of the body, but by ſome power of the body which is evenly diffuſed all over its ſurface, and by which it acts upon the ray and impels it back without immediate contact.

5. *Inflection* is that diſpoſition of a ray of light to be turned out of its courſe when it paſſes very near to the edges of bodies.

6. The angle of incidence is the angle which the line deſcribed by the incident ray makes with the perpendicular to the reflecting or refracting ſurface at the point of incidence.

7. The angle of reflection or refraction is the angle which the line deſcribed by the reflected or refracted ray makes with the perpendicular to the reflecting or refracting ſurface at the point of incidence.

8. Any parcel of rays diverging from a point, conſidered as ſeparate from the reſt, is called a *pencil* of rays.

9. A lens is a medium bounded by two ſpherical, or one plain and one ſpherical ſurface; and the line joining the centres, or which paſſes perpendicularly through each ſurface, is called the *axis*.

There are ſix lenſes, a double convex, a double concave, a plano-convex, a plano-concave, a concave-convex, and a meniſcus.

10. The focus of ray is that point from which they diverge, or to which they converge.

The focus of parallel rays is called the *principal* focus.

The ſun's light conſiſts of rays of different colours and differently refrangible.

For if the ſun's rays be admitted into a dark room through a ſmall hole in a window ſhutter, and be refracted through a priſm, the image is not round, but a long figure with parallel ſides and ſemicircular ends, the length of which is above five times its breadth; that end which has ſuffered the leaſt refraction is red, and that which has ſuffered the greateſt is violet. The whole image conſiſts of ſeven diſtinct colours, lying in the following order, red, orange, yellow, green, blue, indigo, violet; the red is the leaſt refrangible, and the others more in their order. Theſe are called primary colours, all other colours being only different combinations of theſe. Each colour forms

a diſtinct image of the ſun, which images, in this experiment, running into each other, make a gradual change of colour in the image. But if a convex lens be placed before the priſm, each image will be diminiſhed, and by that means they will be ſeparated and each rendered diſtinct.

If two coloured images be formed with two priſms, and thrown one upon the other, then if that image be looked at through a priſm, the images will be again ſeparated.

The primary colours cannot be ſeparated into other colours by any refraction.

For if in the laſt experiment all the colours but one be ſtopped, for inſtance, the red, and that be again refracted by a priſm, it ſuffers no alteration in colour. By ſuffering the colours to paſs in ſucceſſion, from the red, each preſerves its colour, but the quantity of refraction keeps increaſing. The image of each colour is perfectly circular, which ſhews that the light of each colour is refracted regularly without any dilitation of the rays; it is therefore incompounded, or homogeneal.

If the breadth of each colour in the ſpectrum formed by the priſm be meaſured, it will appear that the breadth of the red, orange, yellow, green, blue, indigo, violet, are as the numbers 45, 27, 48, 60, 60, 40, 80, reſpectively.

If the circumference of a circle be divided into 45°, 27°, 48°, 60°, 60°, 40°, 80°, and the reſpective ſectors be painted red, orange, yellow, green, blue, indigo, violet, and the circle be turned ſwiftly, it will appear nearly white. For the ideas we have from the impreſſion of light remain for a ſhort time, and thus the colours excite the ſame ſenſation as if they all entered the eye collected together.

If the direct image of the ſun through a ſmall hole be received upon a ſkreen perpendicular to the rays, and the rays be then intercepted by a priſm and fall perpendicularly on the firſt ſide, if the diſtance from the place of the direct image to the neareſt edge of the red and fartheſt of the violet be meaſured, they will be the tangents of the angles of deviation, and the radius of which is the diſtance from the point where the rays emerge to the place of the direct image.

The angle of incidence on the ſecond ſide of the priſm equal the refracting angle of the priſm, to which add the deviations of the two extreme colours, and we get the two angles of refraction, the ſines of which will be to the ſines of incidence

incidence as 77 and 78 to 50. Hence if the difference between 77 and 78 be divided in the ratio of the breadth of each colour, it gives for the ſines of refraction, the common ſine of incidence being 50; that is, the ſine of incidence: the ſine of refraction of the red rays:: 50: not leſs than 77 nor greater than $77\frac{1}{8}$, the boundary of the red; and the ſame for the reſt.

Candle light is of the ſame nature as the light from the ſun.

For rays from a candle may be ſeparated into all the different colours, and they lie in the ſame order as in the light from the ſun.

The ſun's light conſiſts of rays which differ in reflexibility, and thoſe rays which are moſt refrangible are moſt reflexible.

For after forming a coloured image, as before, with a priſm, by turning the priſm about its axis, until the rays within it, which in going out into the air were refracted at its baſe, become ſo oblique to the baſe as to begin to be totally reflected thereby, thoſe rays become firſt reflected, which before at equal incidences with the reſt had ſuffered the greateſt refraction.

According to Sir I. NEWTON, the colours of natural bodies ariſe from hence, that ſome reflect one ſort of rays and another ſort more copiouſly than the reſt.

For every body looks moſt ſplendid in the light of its own colour, and therefore it reflects that the moſt copiouſly. Beſides, by reflection you cannot change the colour of any ſort of rays; and as bodies are ſeen by reflection, they muſt appear of the colour of thoſe rays which they reflect. This is the opinion of Sir I. NEWTON. But Mr. DELAVAL accounts for the colours of natural bodies in a manner different from this. See the *Manchester Memoirs*, Vol. II.

Thin tranſparent ſubſtances, as glaſs, water, air, &c. exhibit various colours according to their thickneſs.

For a very thin glaſs bubble, or a bubble of water, will appear to have concentric colours: the bubble blown with water, firſt made tenacious by diſſolving a little ſoap in it, continually grows thinner at the top by the ſubſiding of the water, the rings of colours dilating ſlowly, and overſpreading the whole bubble. A convex and concave lens of nearly the ſame curvature being preſſed cloſely together, exhibit rings of colours about the point where they touch. Between the colours there are dark rings, and when the glaſſes are very much compreſſed, the central ſpot is dark. Sir I. NEWTON, to whom

we

we owe all theſe diſcoveries, found the thickneſs of the air between the glaſſes where the colours appeared to be as 1, 3, 5, 7, 9, &c. and the thickneſs where the dark rings appeared to be as 0, 2, 4, 6, 8, &c. The coloured rings muſt have appeared from the reflection of the light, and the dark rings from the tranſmiſſion of the light. The rays therefore were tranſmitted when the thickneſs of the air was 0, 2, 4, 6, 8, &c. and reflected at the thickneſſes 1, 3, 5, 7, 9, &c. Sir I. NEWTON therefore ſuppoſes, that every ray of light in its paſſage through any refracting ſurface is put into a certain conſtitution or ſtate, which in the progreſs of the ray returns at equal intervals, and diſpoſes the ray at every return to be eaſily tranſmitted through the next refracting ſurface, and between the returns to be eaſily reflected by it. Theſe he calls fits of eaſy tranſmiſſion and reflection.

LIGHT AND HEAT TWO DISTINCT BEINGS.

THE following propoſitions relating to the nature of Fire, and the following laws of its motion, are taken from Dr. Hillary's *Book upon that ſubject, and are ſo curious, that a copy of them will, I believe, pleaſe many of our readers. They are as follow:*

PROPOSITION.

I. FIRE is a being which exiſts in all places, or in every part of ſpace in the whole univerſe.

II. Pure fire is a real body, and conſiſts of the moſt ſimple, ſolid, hard, ſmooth, and ſmalleſt elementary particles of all matter yet known.

III. Pure fire is one and the ſame being in all places. Or there is but one ſpecies of fire exiſting in nature.

IV. Pure elementary fire penetrates, pervades, rarifies, and expands all other bodies in the univerſe, both ſolid and fluid, which fall under the obſervation of our ſenſes. And this power is peculiar to fire only, and to no other body, that we yet know.

V. Pure

V. Pure fire is a body without gravity; and has no more tendency to any one part of ſpace, than it has to any other part.

VI. Pure fire exiſts in a ſtate of equilibrium and reſts in every part of ſpace, till that ſtate is changed by the motion of other bodies, or by the directing power of the ſun; and thoſe ceaſing to act on it, it reſtores itſelf by its repulſive power, to the ſtate of equilibrium and reſt again.

LAW.

I. FIRE is attracted and collected by the motion and attrition of all other bodies.

II. The elementary particles of fire are in a conſtant ſtate of repulſion to each other; and the nearer they are brought to contact, the greater is their repulſive force from each other.

III. Fire is put in motion in parallel right lines, by light emitted from the ſun, and cauſed to move with force, and produce heat and more light.

Theſe propoſitions and laws the Doctor proves by many curious experiments as well as arguments; and he concludes, that fire and light are two different and diſtinct beings, which he likewiſe proves by experiments as well as argument. One of the former ſort of proofs he gives us as follows:

"Firſt, it is evident and univerſally acknowledged, that the moon is a body which has no light but what it receives from the ſun."

"Then let us place a concave ſpeculum, as that of *Villet's*, (with which the experiment has been made,) oppoſite to the moon when ſhe is at the full, in a ſerene cold night, and the light which the moon receives from the ſun will be reflected from it upon the ſpeculum, and from thence into its focus, where a moſt reſplendent and refulgent light will be ſeen, almoſt equal to that received and reflected by the ſame ſpeculum from the ſun, only a little paler; then place a thermometer, which is eaſily removed, by the leaſt degree of heat or fire, as that of *Drebbellius* in that *refulgent focus*, and we ſhall find that the air in the thermometer will not be in the leaſt expanded or moved; and ſhews, that there is no more fire in that focus than there was before the reſplendent light was collected there, or was then in the circumambient air, though ſo great a quantity

tity of light was in that focus at the ſame time. This experiment demonſtrates, that a great quantity of very bright refulgent light may be collected, and can exiſt alone in a given ſpace, without any addition of heat, or any increaſe of the quantity of fire. It alſo ſhews, that this light, which comes from the ſun, is, when thus reflected from the moon, ſo changed in its power of acting on fire, that it has totally loſt its power of putting the pre-exiſting fire in motion in parallel right lines, and producing heat. The ſame experiment being made, though with a much leſs ſpeculum, within the torrid zone, where ſo great a quantity of fire exiſted in the common air where the experiment was made, that it cauſed the mercury in *Farenheit's* thermometer to riſe as high as 80 degrees, yet the reflected light from the moon, which was ſo refulgent in the focus of that glaſs ſpeculum, did not in the leaſt act on that pre-exiſting fire, ſo as to put its particles in motion, nor produce the leaſt increaſe of fire or heat. Hence it is evident, that as this great light, neither acts as fire, nor produces the ſame effects which fire does, it conſequently is not fire."

Query.

WHY does the ſun extinguiſh a culinary fire, and yet not put out the flame of a farthing candle?

Anſwer.

THE properties of fire are not yet thoroughly known; thus for inſtance, in many of our mines in England: In ſome the miners are obliged to work by the light of a ſteel wheel ſtriking againſt a number of flints, for the flame of a candle would at once ſet the whole mine on fire. In other mines they are obliged to work by the light of a candle, and a ſingle ſpark from a flint and ſteel would ſet the mine into a blaze. Now with regard to the queſtion in hand, the blaze of a culinary fire is of ſuch a nature, that it requires a ſtrong body of air for its ſupport; but the warm ſun beaming in through a window, rarifies the air, and takes away that fuel (if I may ſo call it,) which feeds the fire. On the other hand, the flame of a candle is ſuch, that it requires the ſmalleſt and eveneſt quantity of air to keep it alive; therefore the rarefaction cauſed by the beams of the ſun can have no power upon it.

Query.

Query.

IT is well known, from repeated obſervations, that in not weather, when the ſun has ſhined for ſeveral days ſucceſſively, the effect of the burning glaſs is much weaker than when the ſun ſhines immediately after a ſhower. Required the reaſon of this phœnomenon.

Anſwer.

FROM experience it is well known, that heat exhales from the earth a prodigious number of ſulphureous hemogeneous particles, which by their gravity float in the atmoſphere, abſorb and prevent the incorporating rays from falling parallel, or with ſuch great coaleſcence upon the mirror. Whence immediately after a ſhower, the rain precipitating the ſulphureous particles, purges the air of its abſorbing matter, ſo that the numerous converging rays fall parallel upon the mirror, and are driven againſt the combuſtible body, with an incredible, ſuperlative, inflammable force.

A curious Query, by Mr. Newton Boſworth, Peterborough, *taken from Whiting's* Mathematical and Philoſophical Delights, *No.* 9 *lately publiſhed; and an Anſwer by* Mr. Gregory.

IT has been proved by repeated experiments, that neither ſpirits of wine, or any other inflammable liquor can be ſet on fire by any burning glaſs yet made uſe of, how is this curious phœnomenon to be accounted for?

Anſwer.

So long as it was the general received opinion that the ſun was a body of fire, and that the ſolar rays were hot, it muſt appear a very ſingular phœnomenon that ſpirits of wine could not be ſet on fire by a burning glaſs, when the ſame means would fuſe iron and gold, calcine foſſils, and vitrify tiles and pumice ſtones. I know not what methods have been hitherto made uſe of to account for this, nor can I readily conceive how it can be done ſatisfactorily, without according to the opinions lately propoſed concerning the nature of the ſun.

Several weighty arguments have been offered by Dr. Herſchel and others, to ſhew that in all probability the ſun is but little hotter than the earth we inhabit, and that of courſe, the rays which

which are emitted from him, (or more probably from his atmoſphere) are not hot. They produce heat, only when acting upon ſome peculiar kinds of matter, as the colliſion of flint and ſteel produce fire, though neither of them are hot.

Bodies are more heated from the action of the ſun's rays, in proportion as they are more denſe, or as they are more rough; they are alſo more heated in proportion as their colour deviates from white, and the more opaque bodies are, the more they are affected by this method of producing heat.

Perfectly white and perfectly tranſparent ſubſtances, have very little, if any, heat produced in them by the action of the ſun's rays. Theſe obſervations are the reſult of repeated experiments; but to account for the different diſpoſitions of various ſubſtances, (as deduced from theſe experiments) is a taſk that cannot very readily be performed, without a further acquaintance with the arcana of nature, than has yet fallen to the lot of ſhort-ſighted mortals.

The GREAT ARCHITECT has, we may be aſſured, for wiſe purpoſes, given to different ſubſtances, different qualities and powers, and with this we perhaps ought to reſt ſatisfied until the time arrives when HIS *people* ſhall, ſeparated from this veil of mortality, view HIM, and the *grand plan* of all his works, as deſigned from eternity, with enlarged faculties, rapture undeſcribable, and gratitude unbounded*.

AN ESSAY ON THE AURORA BOREALIS.

SUPPOSE the earth a great magnet.—That magnetic effluvia are conſtantly iſſuing in great quantities from its North Pole and that theſe move from the north to the ſouthward, in the direction of what is called the magnetic meridian— that theſe effluvia are of a martial or ferrugineous nature, nothing being magnetical but a ſubſtance of that kind, and vice verſa.

Iron

* But may not the reaſon be this, (viz.) The focus falling upon one point or particle of the fluid, that immediately quits its ſtation for another, and ſo keeps in a continual ſtate of agitation, ſtill flying from the centre of the ſurface in all directions; conſequently, that centre will be the hotteſt particle in the fluid, and muſt undoubtedly kindle if it was not for the ſtate of perturbation the fluid was now got into, which will reſemble a fluid in a ſtate of boiling; this I preſume may be the reaſon why. For a fluid, though it may be inflammable, yet put into a veſſel over the fire, will never kindle without boiling.

Iron and ſulphur, even in their groſs bodies, mixed with a little water, are exceeding apt to take fire, much more ſo, when highly ſubtilized and attenuated.—The hot mineral waters, probably ariſe from this, and ſo may volcanos. All chemiſts know with what eagerneſs ſulphur acts upon iron. Several volcanos, or burning mountains, having been diſcovered of late years in and about the north-polar-regions, which caſt up ſulphureous vapours to an immenſe height. There are ſprings near them the hotteſt in the world, their heat even equalling that of boiling water.—May not thoſe ſulphureous vapours blended with the magnetic or ferrugineous effluvia, catch fire and fulgurate?

The vapour or fume of iron diſſolved in ſpirit of vitriol is moſt readily ſet on fire.—May not the magnetic effluvia give them a kind of magnetic direction; We ſee, in fact, the lucid columns, or radiating flaſhes, of the Aurora Borealis, almoſt always ſhot off from the north to the ſouth, correſpondent in a great meaſure to the magnetic meridian.—And I have conſtantly obſerved the corona, concourſe, or concentration, if I may ſo call it, of theſe lucid rays near the zenith ſo much to the eaſt of it, as anſwered nearly to the weſtern declination of the common magnetic needle; that is, a ſtraight line, drawn from one to the other, would be nearly in the direction of the magnetic meridian.—I think I never obſerved the corona to the weſtward of it.—What ſeems not a little to confirm this notion is, that, during the appearance of a conſiderably great and vivid northern light, the magnetic needle ſuffers very great agitations; cauſed, probably, by the colluctation and exploſion, of the ſulphureous and magnetic effluvia. This is more particularly obſerved in Sweden and the north parts of Europe, as being near the ſource of theſe effluvia.

But, further, as we ſcarce ever ſee an Aurora Borealis, but when the wind blows from ſome point or other between the eaſt and weſt of the northern ſemi-circle, this alſo, may help to drive the ſulphureous coruſcating vapours ſouthward.—And when the wind is very ſtrong from E. N. E. or W. N. W. it may not a little alter their magnetic direction, or current. I have ſeveral times obſerved, when a ſtrong north-eaſterly wind hath blown, ſome faint appearances of a northern light here and there, and abundance of ſmall, lucid coruſcating nubeculæ ſcattered up and down the hemiſphere, now ſuddenly appearing, then diſappearing, ſo that I imagined the wind had

diſperſed the fund of luminous vapours; for we ſee ſuch lucid vibrating, broken, ſmall clouds after the grand exploſion, and at the end of a common Aurora Borealis.—Nay, frequently, ſuch ſmall, bright, flaſhing clouds are ſeen up and down the heavens, without any other appearance of an Aurora Borealis, the lucid vapours being then but in ſmall quantities, and much ſcattered: but it is remarkable, that theſe little, flitting, luminous clouds ſeemed always in a vibrating, tremulous motion, and moving very faſt from north to ſouth, though ſometimes there was little or no wind.—Theſe nubeculæ were ſo extremely thin, that even ſtars of the third and fourth magnitude were ſeen through them.

Thoſe northern lights are ſeen vaſtly more frequent, more bright, more beautiful, and variouſly coloured, in the northern parts of Europe than here; and here much more than to the ſouthward; becauſe in the polar regions, the magnetic effluvia are vaſtly more ſtrong and copious, and the neighbouring volcanos ſend up immenſe quantities of ſulphureous vapours (which cannot but riſe very high in ſuch a denſe, cold atmoſphere) and theſe, as it were, fermenting with one another, catch fire.—In Sicily, and the ſurrounding ſeas, they ſee luminous appearances, very near reſembling thoſe of the Aurora Borealis, when Veſuvius or Etna burn, and theſe rays are commonly of various colours, as thoſe of the northern lights, viz. red, yellow, greeniſh, crimſon, &c. Poſſibly both the one and the other are tinged by ſome mineral ſubſtance from the volcanos. For though globules of rain may refract light of different colours, there ſeems to be nothing in the matter of an Aurora Borealis that is apt to do it.—Beſides, it is unqueſtionable that the Aurora ſhines by its own light, and not from the ſun, as well as the lights of Veſuvius.

We well know that different minerals will tinge flame of different colours.—May not then the diverſity of colours of an Aurora be another argument that it ariſes from the exhalations of volcanos. The ſulphureous vapours of volcanos are ſhot up to an inconceivable height, (ſometimes even great ſtones are thrown up from them to four or five hundred feet, and the aſhes vaſtly higher, ſo as oftentimes to be carried by the wind fifty or a hundred miles, nay, leagues) ſo high indeed, that they may retain very little gravity, their centripetal force continually decreaſing, as their diſtance from the earth increaſes —and their centrifugal will be much increaſed by their revolving

volving about the axis of the earth in a very large circle.—But further, ſulphureous vapours have a kind of a vis centrifuga, and will riſe in vacuo, whereas all other vapours ſink.—It is certain, the fumes of gunpowder will riſe to the top of a tall exhauſted receiver, and even prove lucid, though the gunpowder itſelf doth not flaſh.—Thus, the vapours over Veſuvius are ſometimes very lucid, though the crater-magnet at that time, actually belched out flame. We know that ſulphureous vapours are ſometimes carried to an aſtoniſhing height, and collected into vaſt bodies of inflammable matter, far above the groſs terreſtrial atmoſphere.—The great Dr. Halley, from very juſt obſervations, eſtimated the meteor of the 19th. of March, 1718-19, (which caſt ſuch an amazing brightneſs, and made ſuch a very loud exploſion) to be very near ſeventy miles perpendicular above the ſurface of the earth; whence it was ſeen over a great part of Europe at the ſame time. Now if ſuch a great body of ſulphureous vapours as this could be ſuſtained at the very top of our atmoſphere, or even in the æther above it, how much higher may we ſuppoſe the mere ſubtile vapour of the lumen boreale to be carried?—This will account for the great height and diſtance ſome of the northern lights are ſeen at, without having recourſe to M. Mairan's zodiacal light, or Profeſſor Eulet's repulſion of the ſun beams. It is poſſible theſe vapours, when carried to ſuch a vaſt height, and in a medium ſo exceeding rare, may actually become lucid, eſpecially when mixed with ætherial nitre, as the fumes of gunpowder mount and ſhine in vacuo.—Indeed this phœnomenon of the gunpowder ſuggeſts to me, that a highly ſubtilized aerial nitre always enters the compoſition of an Aurora, (for it is every where diffuſed throughout the whole atmoſphere) and nothing is more like the vivid pearl-coloured flaſhes of an Aurora, than a deflagration of nitre and ſulphur; and the flame may be tinged with red, green, yellow, &c. by the addition of different minerals—Certainly, nitre, ſulphur, and iron, are greatly diſpoſed to inflame and coruſcate.—The arctic regions abound with nitre.—The northern lights are vaſtly more frequent in cold ſeaſons, when the atmoſphere is greatly ſtocked with nitre.—It is ſcarce to be doubted, but that common lightning abounds with all theſe principles. Hence may ariſe another conjecture, that, as lightning is certainly of an electrical nature, ſo poſſibly may be the nature of an Aurora.—The incredible ſwiftneſs of its

flashes, and the instantaneous propagation of its coruscations through all the northern parts of the hemisphere, seem to favour such a thought.—May not the luminosity be conveyed on the magnetic effluvia, as the electric on an iron wire? But this is, I fear, indulging too far in whimsey. The accounts we have had from Iceland, Greenland, and other places within the arctic circle, by the whale fishers, and others, that have been given by the Jesuits, &c. who travelled to the N. E. parts of China and Tartary, assure us, that there are several volcanos in these parts, some of which have broken out within these few years.—Is it not then the fresh eruptions of some of these volcanos that have produced the northern lights so common of late years? Before this present century began, it is certain, they did not appear for many years even in Sweden, Norway, and Lapland, or at least very seldom; whereas M. Morperitus says, they are now almost constant in these countries during the winter months.—Is is not then the more frequent and violent eruptions of these volcanos that make the Aurora Borealis more common and more illustrious? And is it not the cessation of these eruptions that puts a stop to these luminous phœnomena, as we know they cease for weeks, for months, for years; and that too when all other circumstances seem to favour their productions?

They appear vastly more frequent and great in the most northern countries, as they lie near the source of the magnetic effluvia and sulphureous vapours. Doth not an appearance of a kind of these nocturnal lights and coruscations in Sicily, &c. on the eruption of Vesuvius, and sometimes merely from the sulphureous exhalations issuing from it, without actual flames, seem to confirm this opinion. Moreover it is not altogether improbable, that sulphureous exhalations from most southern volcanos, swimming on the top of the atmosphere and revolving with the earth, round its axis, may be carried towards the poles, and contribute somewhat to the formation of an Aurora. Persons acquainted with natural history and philosophy, will readily see on what principles I have advanced this theory.

REMARKABLE

REMARKABLE PROPERTIES OF NUMBERS.

1. TWICE any number is equal to the ſum of any two numbers equally diſtant therefrom, the one ſo much the greater, and the other ſo much leſs than that number. As twice 9 is equal to 8 and 10, 7 and 11, 6 and 12, 5 and 13, 4 and 14, 3 and 15, 2 and 16, 1 and 17. For if n=given number, and a=the number leſs the greater, then $n-1$=leſs, and $n+1$=greater, whoſe ſum is=$2n$, or double the number.

2. Only 2 and 2 whole numbers, have their product and ſum alike; tho' there are infinite broken numbers having that property.

3. The numbers 5 and 6 are called circular numbers; becauſe, like the circle, terminating where it begins, theſe numbers multiplied by themſelves, ever ſo often, always end in the ſame number: 5 by 5 make 25, and that product multiplied by 5, makes 125. So 6 by 6 make 36, and 6 times which make 216.

4. Any number divided by 9 will leave the ſame remainder as the ſum of its figures divided by 9; conſequently ſo will any number compoſed of the ſame figures tranſpoſed, and the ſum of its figures divided by 9; thus 654 divided by 9, leaves 6 for a remainder; ſo will $6+5+4=15$, divided by 9, leave 6 alſo, and ſo will 645, 564, 546, 456, and 465, and the ſum of any three figures ſo divided by 9, leave the ſame remainder.

5. If any number is divided by 9, the ſum of its figures is alſo diviſible by 9; conſequently ſo will any number compoſed of its figures tranſpoſed, and its ſum, be diviſible by 9; by which means many numbers diviſible by 9 may be quickly found. Thus 135, 153, 315, 351, 513, 531, by tranſpoſition are diviſible by 9.—N. B. This property proves multiplication by caſting away the nines; and diviſion, and extraction of the ſquare root are proved in the ſame manner, by adding the nines caſt away in the remainders.

6. Any number divided by 3, will leave the ſame remainder as the ſum of its figures divided by 3, conſequently ſo will any number compoſed of the ſame figures tranſpoſed, and the ſum of its figures divided by 3. Thus 257 divided by 3, leaves 2 remaining; and $2+5+7=14$, divided by 3, leaves 2 remaining alſo.

7. If any number is diviſible by 3, the ſum of its figures will be alſo diviſible by 3; conſequently ſo will any number of the ſame figures tranſpoſed, and the ſum of its figures being diviſible by 3. Thus 123, 132, 213, 231, 312, 321, by tranſpoſition, and the ſum of any three figures are all diviſible by 3.

8. Any odd ſquare number added to half 1 leſs than that number ſquared, the ſum will be a ſquare number. Thus 9 added to half $(9-1)$ 8, or 4 ſquared $=16$, will be 25, a ſquare number. Alſo any ſquare number added to half 1 leſs than that number ſquared, the ſum will be a ſquare number; but will be a broken ſquare number when the ſquare number taken is an even number. For $aa+\frac{aa-1}{2}$ ſquared) $=\frac{a^4-2aa+1}{4}=\frac{a^4+2aa+1}{4}$, is a ſquare whoſe root is $\frac{a^2+1}{2}$. Hence $16+\frac{15}{4}$ ſquared $=\frac{289}{4}$ whoſe root is $\frac{17}{2}$.

9. Any even number and its half ſquared, and 1 added together, the ſum will be a ſquare number. Thus 8 added to (its half ſquare) 16 and 1 make 25, a ſquare number. Alſo, any number and its half ſquared, and 1 added together, will be a ſquare; but will be a broken ſquare number when the firſt number is taken odd. For $a+\frac{a}{2}$ ſquared, $\frac{a^2}{4}+1=\frac{a^2+4a+4}{4}$, whoſe root is

a

$\frac{a+2}{2}$. Thus, $7 + \frac{7}{2}$ ſquared, $\frac{49}{4} + 1 = \frac{81}{4}$, whoſe root is $\frac{9}{2}$.

10. The property of 3, 4, and 5, (or twice three, &c. thoſe numbers,) are ſuch that they will completely form a right-angled triangle. N. B. This property is of uſe among artificers, ſurveyors, &c. for adjuſting their ſquares by a right angle, where the ſides 3 and 4 meet. Lines or cords may be uſed of thoſe lengths, or double, triple, &c. to lay down a right-angled triangle.

11. The number 11 multiplied by 2, 3, 4, 5, 6, 7, 8, 9, will end and begin with the like numbers, 22, 33, 44, 55, &c.

12. The numbers 220 and 284, have the aliquot parts of one number equal to the other number. Thus the aliquot parts of 220 are 110, 55, 44, 22, 20, 11, 10, 5, 4, 2, 1, making 284; and the aliquot parts of 284 are 142, 71, 4, 2, 1, making 220.

13. Perfect numbers are thoſe whoſe aliquot parts, in one ſum, are equal to thoſe numbers. As 6 is the firſt perfect number, whoſe half 3, third 2, and ſixth 1, in one ſum make 6. The next perfect number is 28, whoſe half 14, fourth 7, ſeventh 4, fourteenth 2, and twenty-eighth 1, in one ſum make 28. Perfect numbers are ſo few, that between 1 and 1000000000000, with 12 places of cyphers there are only theſe, viz. 6, 28, 496, 8128, 130816, 2096128, 33550336, 536854528, 8589869056, 137438691328, alternately-ending in 6 and 8. The 20th perfect number is 1511172745155376893 1328, conſiſting of 23 figures. The general rule to find perfect numbers is this; 2^n into $2^{n+1} - 1$ is a perfect number; where $2^{n+1} - 1$ muſt be a prime number, and $n = 1, 2, 4, 6, 8, 10, 12$, &c. the 1ſt, 2d, 3d, 4th, 5th, &c. perfect number in ſucceſſion. Hence the value of n, for any perfect number

number according to its place, will always be equal to the number of the place leſs one doubled. Thus the value of n for the 20th perfect number will be ($20 - 1 = 19$ doubled) $= 38$; for the 3d perfect number $3 - 1 = 2$ doubled, $= 4 = n$, &c. whence the perfect number as above.

N. B. If n be any odd number above 1, then $2^{n+1} - 1$, (above expreſſed) will be a compoſite, and no prime number.

A SPORTIVE PROBLEM.

TO find the number of pieces of money any perſon holds in the right or left hand, firſt holding as many pieces in one hand as the other.

Bid the perſon holding the equal number of pieces in both hands, take a given number (poſſible) from the number of pieces held in one hand, and put them to the number of pieces held in the other hand, then bid the ſame perſon take as many pieces out of that hand into which the ſaid given number of pieces were juſt put, as remained in the hand whence thoſe pieces were taken, and put them back into the ſame hand; then there will be left in the other hand, exactly twice the given number of pieces that were firſt taken out of the contrary hand.

DEMONSTRATION.

Let $x =$ No. pieces held in each hand, and n the given No. (leſs than x) to be taken out of one hand and put into the other (ſuppoſe from the pieces in the left and put them into the right hand;) then there will be $x - n$ pieces in the left, and $x + n$ pieces in the right hand. Now taking $x - n$, the pieces in the left, out of $x + n$ pieces in the right hand, and there will remain $x + n - x + n = 2n$ pieces in the right hand; being exactly double the number of pieces firſt taken out of the contrary, or left hand.

ANOTHER.

ANOTHER.

OUT of a common pack of fifty-two cards, let part be diſtributed into ſeveral diſtinct parcels or heaps in the manner following: upon the loweſt card of every heap let as many others be laid as are ſufficient to make up its number twelve, as if four be the number of the loweſt card, let eight others be laid upon it; if five, let ſeven; if a, let twelve $- a$, &c. It is required, having given the number of heaps, which we ſhall call n, as alſo the number of cards ſtill remaining in the dealer's hand, which we ſhall call r, to find the ſum of the numbers of all the bottom cards put together.

SOLUTION.

Let a, b, c, &c. expreſs the number of the bottom cards in the ſeveral heaps; then will $12 - a$ expreſs the number of all the cards lying upon the bottom card of the firſt heap, that is, the number of all the cards of the firſt heap except the loweſt, will be $12 - a$; therefore $13 - a$ will be the number of all the cards in the firſt heap; for the ſame reaſon $13 - b$ will be the number of all the cards in the ſecond heap; and $13 - c$ the number of all thoſe in the third, and ſo on; therefore the number of all the cards in all the heaps will be $13 \times n - a - b - c$, &c. make $a + b + c$, &c. (or the ſum of the numbers of all the bottom cards) $= x$, and then we ſhall have the number of all the cards drawn out into heaps $= 13n - x$; but theſe, together with r, the number of cards undrawn out, make up the whole pack 52; therefore $x + r = 13n + r$; therefore $x = 13n - 52 + r$; but $52 = 13 \times 4$; therefore $13n - 52 = 13 \times n - 4$; therefore $x = 13 \times n - 4 + r$; in words thus: From the number of heaps ſubtract four; multiply the reſt by thirteen; and this product added to the number of cards ſtill remaining in the dealer's hand, will give the ſum of the numbers of all

all the bottom cards put together; as for example, let there be three heaps, and thirty cards remaining; now 4 ſubtracted from 3 leaves — 1; this multiplied by 13 gives — 13, and this product added to 30, the number of cards remaining, gives 17 for the ſum of the numbers of all the bottom cards.

A more univerſal Theorem is as follows:

LET n be the number of heaps as before, p the number of cards in a pack; let as many cards be laid upon the loweſt of every heap as are ſufficient to make up its number q; and laſtly, let r be the number of remaining cards as before; and the ſum of the numbers of all the bottom cards will be found to be $\overline{q+1} \times n + r - p$.

IMPORTANT QUERIES.

1. THE writers on Fluxions ſay, that if any quantity is a maximum, or minimum, that quantity being multiplied or divided by any known quantity, the product or quotient will be alſo a maximum or minimum.—Then, if any known quantity be added to or ſubtracted from it, will the ſum or difference be alſo a maximum or minimum?

Anſwer.

Fluxions, deduced from an indefinitely or infinitely ſmall increaſe or decreaſe of finite quantities, are nothing but the finite ratios of the indefinitely or infinitely ſmall quantities by which the ſaid finite quantities are increaſed or decreaſed according to a given condition. Now when any compound variable quantity is gradually increaſed or decreaſed, on certain conditions, till it becomes a maximum or minimum (as may be the caſe when conſtant are compounded with variable quantities, in an expreſſion) its fluxion or variation will be nothing in reſpect of the fluxion of its ſimple variable quantity; it having then neither increaſe or decreaſe in thoſe circumſtances.

Propoſition.

Propoſition.

But in all caſes of variation, if contemporary variable quantities be equal to each other, or in a given ratio, their fluxions will be alſo equal, or in a given ratio; and the contrary. Therefore multiplying or dividing any compound variable quantity (having a maximum or minimum, or not) by a given conſtant quantity, its fluxion will have the ſame ratio to the fluxion of the ſimple variable quantity multiplied or divided by the ſame conſtant quantity.

Thus, the fluxions of xx and x, axx, and ax, or $\frac{xx}{a}$ and $\frac{x}{a}$, are $2xx$ to $\dot{x}$, $2axx$ to $a\dot{x}$, and $\frac{2xx}{a}$ to $\frac{x}{a}$, reſpectively, all in the ſame ratio; being the ſame had xx been a maximum or minimum; as are likewiſe the fluxions of $axx+b$, and $ax+b$, or $axx-b$, and $ax-b$, reſpectively. And the ſame fluxion of any value, (and therefore of o value when its fluent is a maximum or minimum) may have an infinite number of fluents, as the fluent of $\dot{x}$ fluxion may be x, $a+x$, $b+x$, $x-a$, $x-b$, $x-c$, &c. Conſequently, as the product or quantity of a maximum or minimum, in quantity, on certain conditions, is alſo a maximum or minimum, ſo likewiſe a given addition or ſubtraction, in quantity, to and from that given product or quantity (being a maximum or minimum, on certain conditions) will be a maximum or minimum alſo; making no alteration in the property of given conditions.

WHAT IS SPACE?

Anſwer.

Time is to duration as place is to ſpace, or expanſion. They are ſo much of thoſe boundleſs oceans of eternity and immenſity, as is ſet out and diſtinguiſhed from the reſt; and ſo are made uſe of to denote the poſition of finite beings in reſpect of one to another, in ſome infinite oceans of duration and ſpace. Each of theſe have a

twofold

twofold acceptation. Firſt, time in general is taken for ſo much of finite duration as is co-exiſtent with the univerſe, and meaſured out by the motion of its great bodies. Thus it is uſed in the phraſes before all time, and when time ſhall be no more. Place is likewiſe taken for that portion of infinite ſpace poſſeſſed by the material world; though this might more properly be called extenſion. Within theſe two are confined the particular time, or duration, extenſion, or place of all corporeal beings. Secondly, time is ſometimes applied to parts of that infinite duration, that were not really meaſured out by real exiſtence; but ſuch as we upon occaſion do ſuppoſe equal to certain lengths of meaſured time as in the Julian period, which makes an excurſion of 764 years beyond the creation. Thus we may ſpeak of place or diſtance in the great Inane, wherein I can conceive a ſpace equal to or capable of receiving a body of any aſſigned dimenſions. See Lock's Human Underſtanding. The extent of the viſible univerſe, which we know on the loweſt computation, muſt be nearly that of a cube of 1,400,000,000,000 miles diameter, which contains near 3,000,000,000,000,000,000,000,000,000, i. e. 3 ſextillions, or three millions of millions of millions of millions of millions of millions of cubical miles.—An amazing ſpace this! as to any power of imagination ſcarcely to be diſtinguiſhed from infinite ſpace itſelf! but ſince the vaſt viſible ſyſtem of the univerſe is that with which we are alone concerned, and ſuch as even wearies and amazes our faculties, when we attempt ſo much as to imagine its immenſity, I ſhall wade no farther into that unfathomable abyſs of infinite extramundane ſpace; the nicer conſideration of which, like that of infinite duration or eternity, is evidently too large for our finite thoughts; and does ever more aſtoniſh and confound than profit and edify mankind. And no wonder, ſince it is highly probable that both of them, as to their inmoſt nature, and largeſt extent, are alone knowable by that High and Lofty One, who inhabits Eternity.

Many

Many have been the objections to Sir Iſaac Newton, as if he repreſented infinite ſpace as an attribute of the Deity. His words are, "He continues always, and is "preſent every where; and by exiſting always and every "where, he conſtitutes duration and ſpace." But this is ſaying no more than that ſpace and duration do not neceſſarily exiſt; becauſe God is eſſentially and neceſſarily preſent in them. This appears from the words immediately preceding. God is eternal and infinite; omnipotent and omniſcient; i. e. he continues from eternity to eternity; and is preſent from infinity to infinity; he governs all things and knows all things which are done, or can be known. He is not eternity and infinity, but eternal and infinite: He is not duration and ſpace, but has duration of exiſtence, and is preſent. Which laſt words are ſo clearly expreſſive of his meaning, that I am at a loſs to conceive how they could be miſunderſtood. He accounts for the neceſſary exiſtence of ſpace in a way the moſt worthy of the Deity.

Suppoſe a clock has three hands on its dial plate, one of which goes round in 7 days, another in 29 days, 12 hours, 44 minutes, 1 ſecond, and 45 thirds, and the third in 365 days, 5 hours, and 49 minutes.—If all theſe hands are ſet together at any given point of the dial plate, Quere, how many years, months, days, hours, minutes, ſeconds, and thirds of time muſt revolve, before all the hands can meet together again at the ſame point. The meaning of which may be, If a new moon happens at any given time, viz. in a given month, and day of the month, at a given hour and minute, and on a given week day, how long will it be before a new moon happens again, at the ſame given time, viz. month, day, hour, &c. on the ſame given week day, according to the given mean or equal motion?

Answer.

Stands.	*Times of Revol.* d. h. m. s. th.	*Third.*	*Dif. thirds.*
A	7 0 0 0 0	36288000	
B	29 12 44 1 45	153086505	116798505
C	365 5 49 0 0	1893416400	1740329895

Time. Rev. Time. A

As B : 1 : : A : — B performs in A time.

B,

Rev.—as und. Time. Rev.—as und. Time.

A A A B

And 1 — — : A : : 1 : ——— ——— when

B A = B — A,

A and B firſt meet. 1 — —

B

General Rule.

The product of the times of any two revolutions of two revolving bodies, moving uniformly, divided by the difference of thoſe times, will give the preciſe time of the next meeting of thoſe bodies, after ſetting out together and moving the ſame way.

A B

Now, ——— being the next time of A and B meeting

B — A

to C's time of making one revolution, therefore a time muſt be found when a number of A B ——— will be equal

B — A

to ſome other number of C's time, in ratio of A B to B — A × C, to be found in lowest terms. Or when B — A × C

A B,

ſide of the ratio, in lowest terms, × ——— = A B ſide

B — A

of the ratio, in lowest terms × C = A B × C. This happens when the time is the least dividend to the times of revolution

revolution to A, B, C, when thoſe three hands meet. And ſo univerſally the least time of any number of hands meeting after ſetting out together, and moving the ſame way, will be a time which is the least dividend to the times of the ſeveral and reſpective revolutions of thoſe hands.

Hence $\frac{AB}{B-A} = \frac{36288000 \times 153086505}{116798505}$ thirds $= 9$ days, 4 hours, 11 minutes, 44 ſeconds, 39 thirds $\frac{11847105}{116798505}$, preciſely, when A and B first meet. And the least dividend to 36288000, 153086505, and 1893416400 thirds (each two reduced to lowest terms multiplied together, and that product multiplied into their greatest common meaſure) will be $15 \times 240 \times 10080 \times 525949 \times 11 \times 927797 = 19478356745277830400$, to a third $=$ (becauſe $15 \times 240 = 60 \times 60$, and $10080 = 24 \times 60 \times 7$) $7 \times 52594 \times 11 \times 927797$ days $=$ 102871979836 Julian years and 82 days preciſely, required.

N. B. The foregoing is the least time when a mean, new or full moon can happen again at the ſame point of time in the ſame week day, and alſo at the ſame point of time (beginning, middle, or end) of a ſolar year; when the ſun and moon have preciſely the ſame place, as at first ſetting out together.

FINIS.

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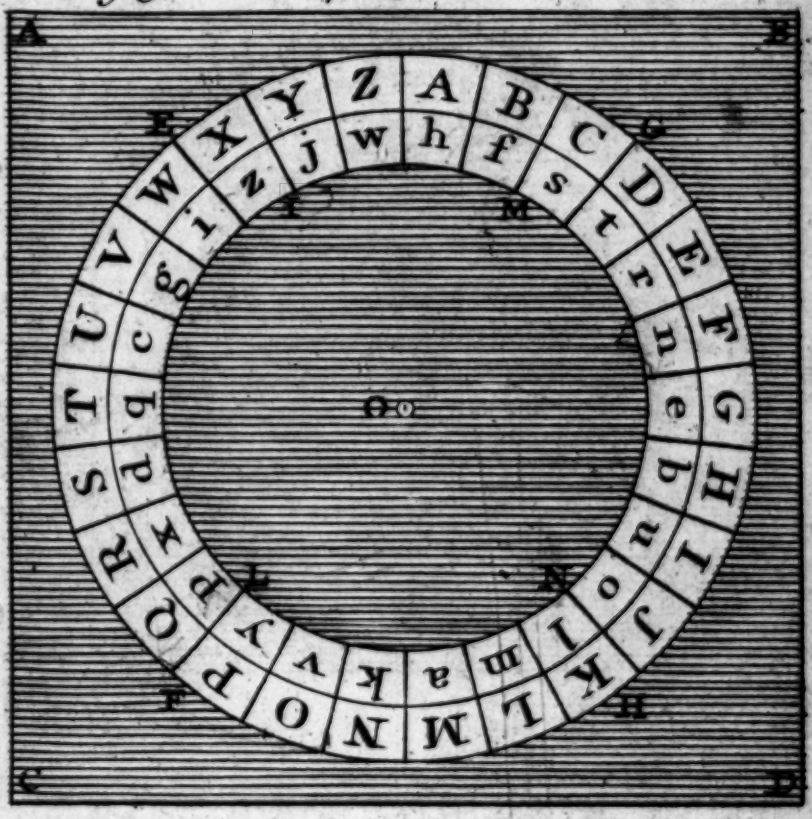
Fig. 1. p. 73.

Fig. 2 p. 73

Fig. 3. p. 152.



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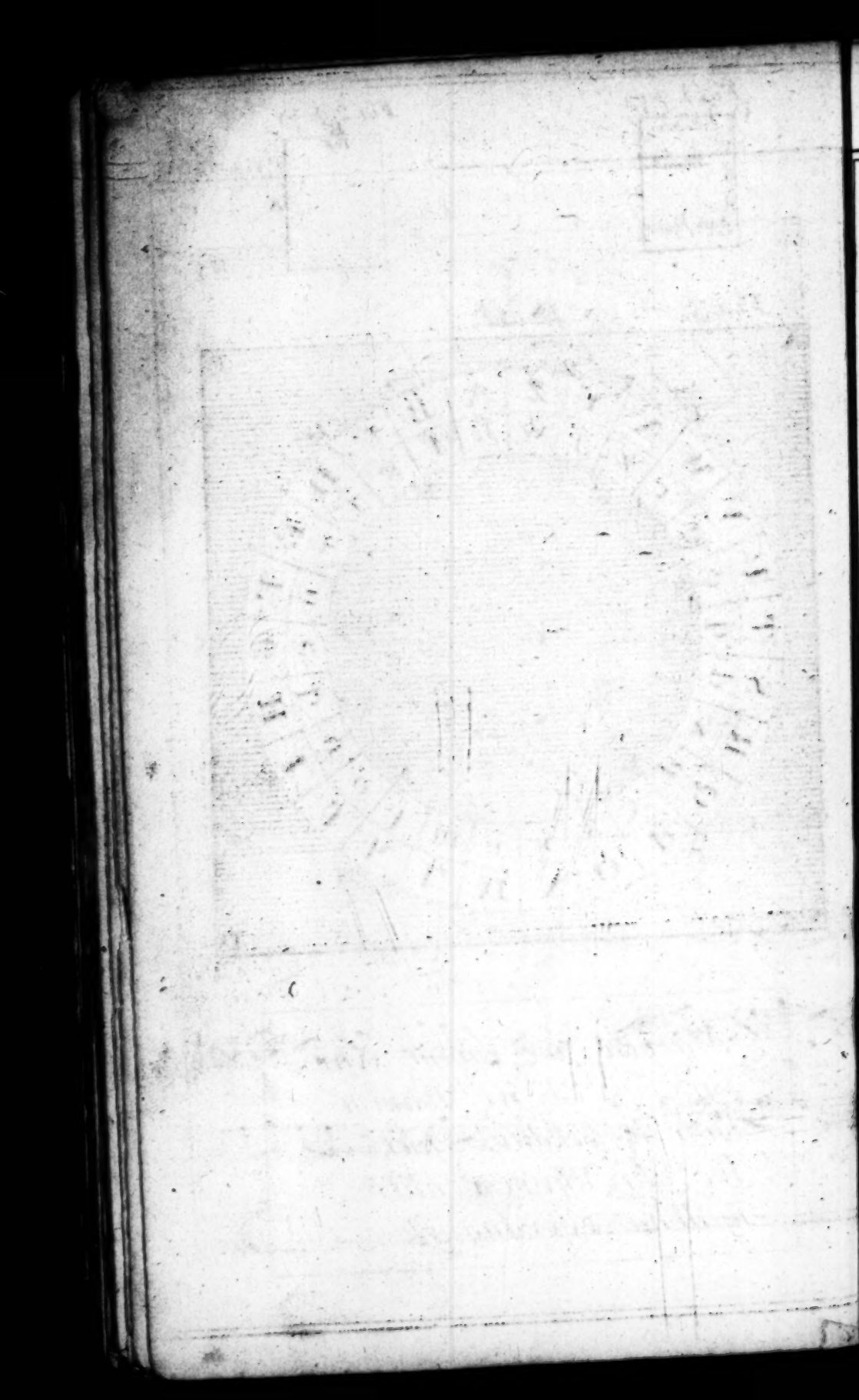
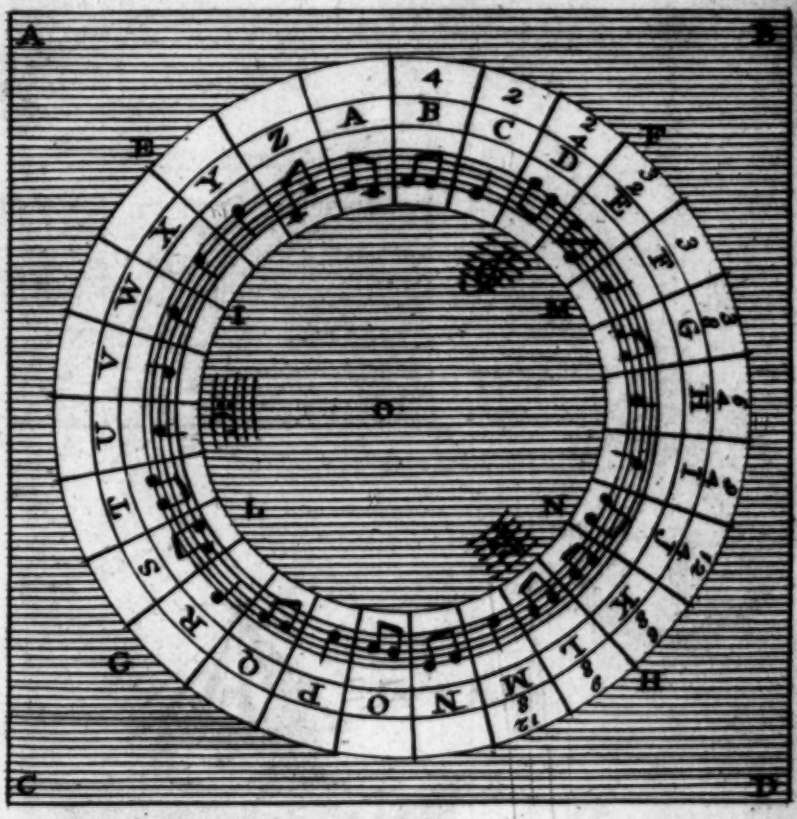


p. 154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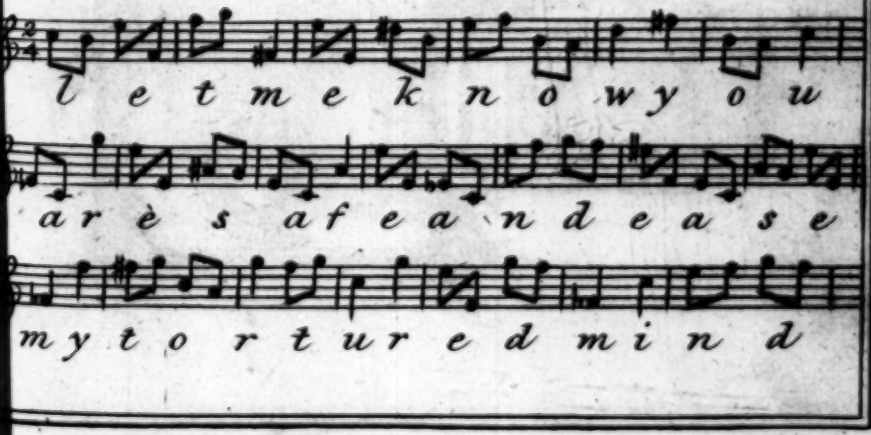
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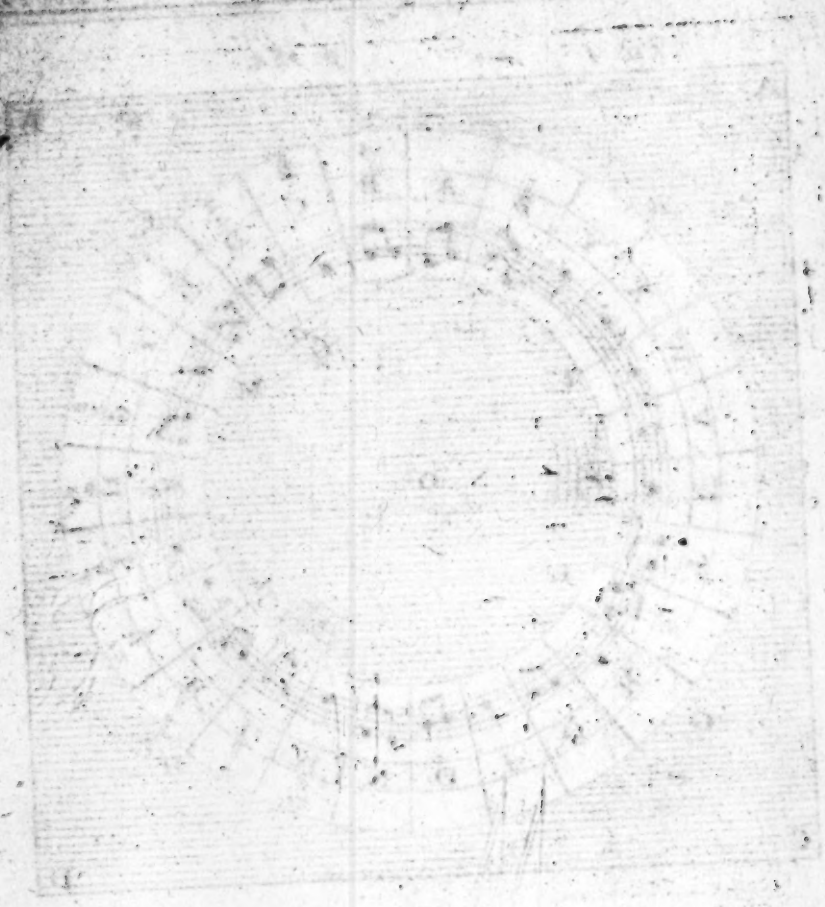


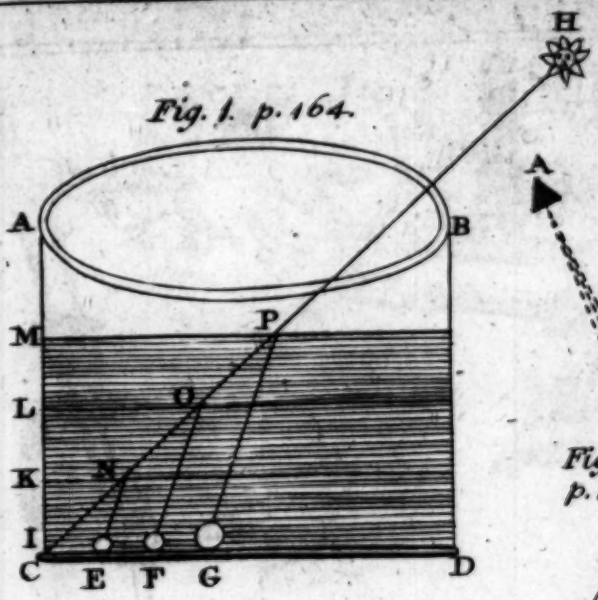


Fig. 1. p. 164.

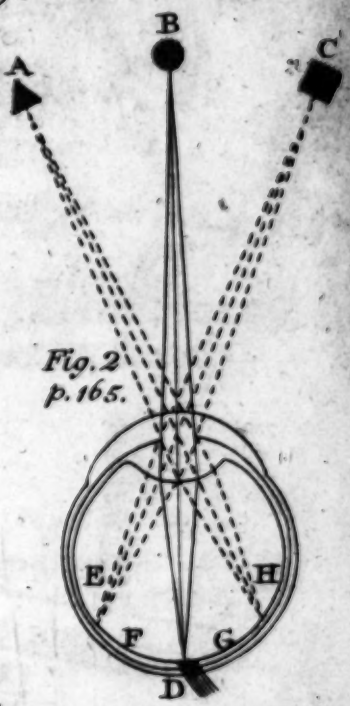
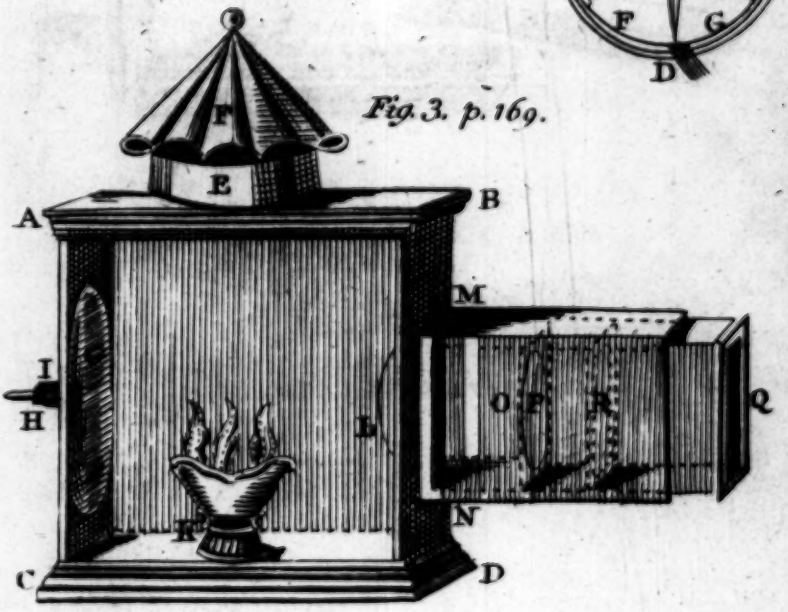


Fig. 2 p. 165.



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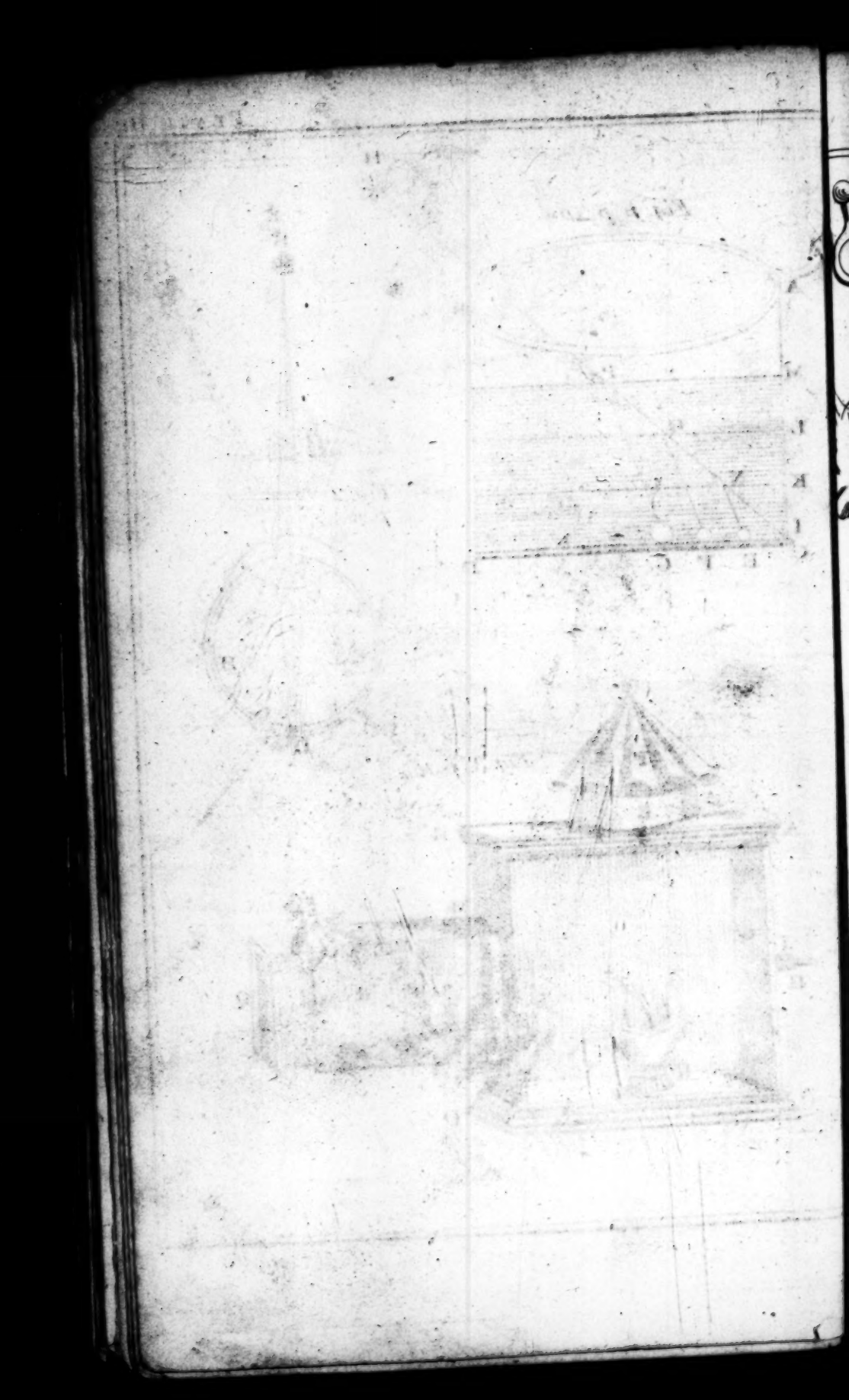


Fig. 3. p. 184.

Fig. 2. p. 184.

Fig. 4 p. 185.

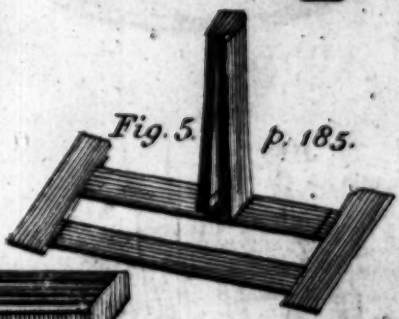
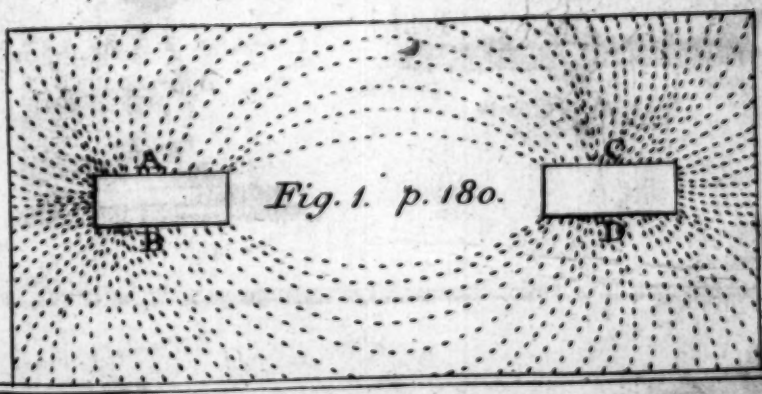


Fig. 5. p. 185.

Fig. 7. p. 185.

Fig. 6. p. 185.



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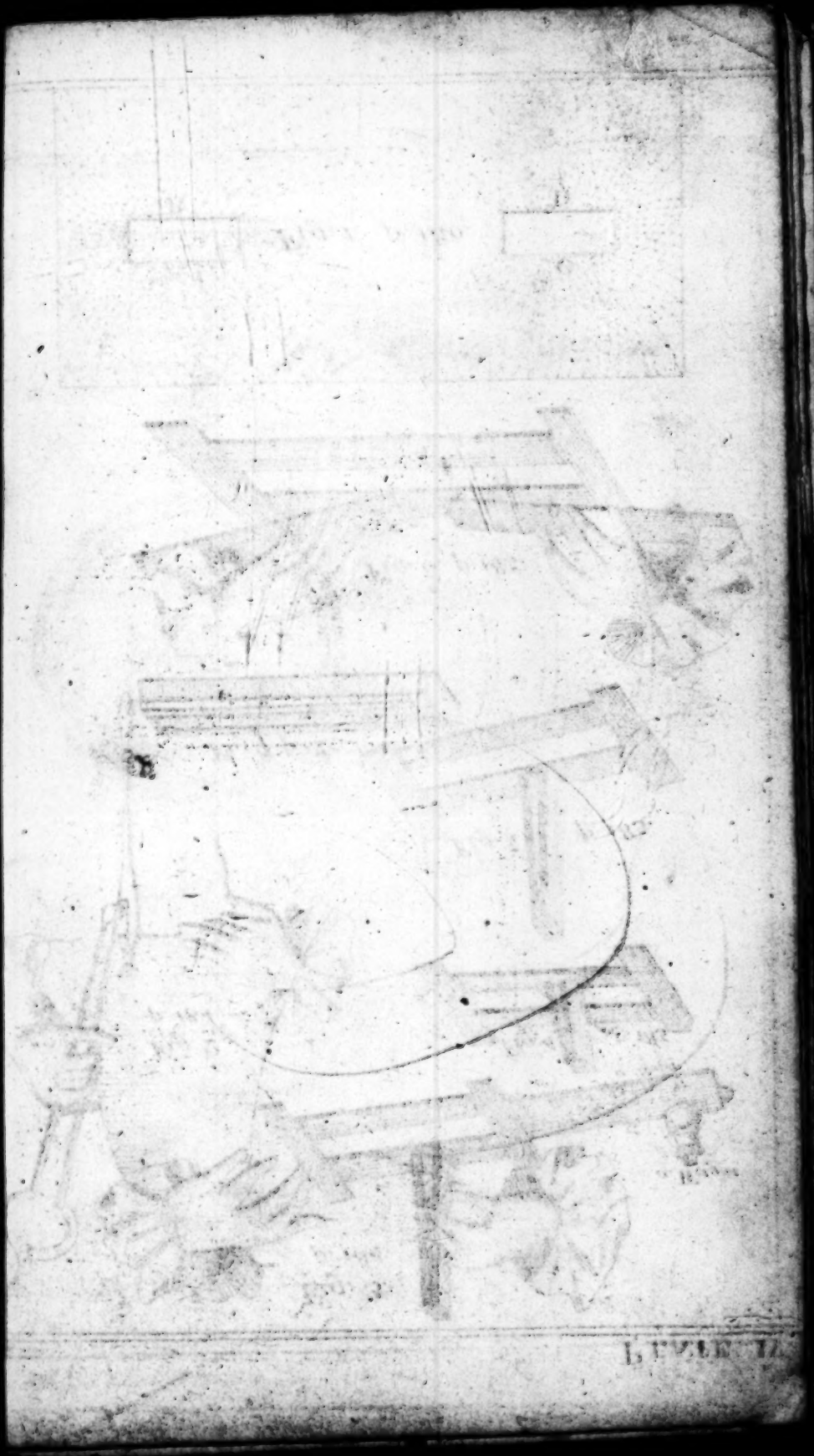


Fig. 2. p. 186.

Fig. 1. p. 186.

Fig. 4. p. 197.

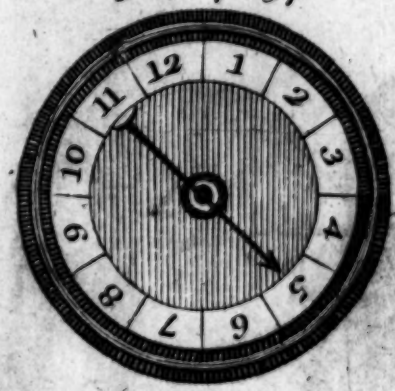


Fig. 3 p. 192.

Fig. 4. p. 197

Fig. 5. p. 197

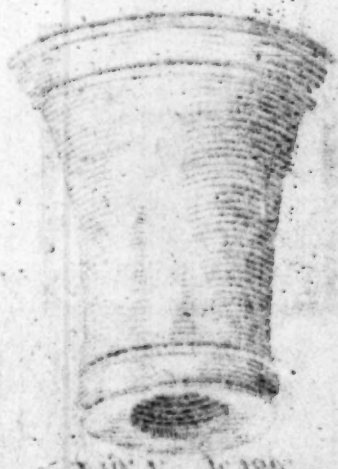
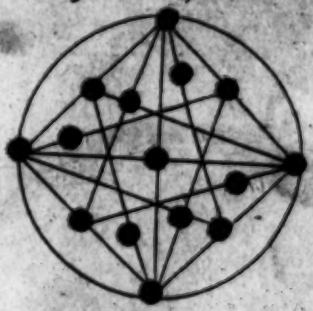


Fig. 4. p. 250.



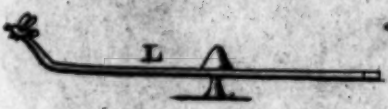
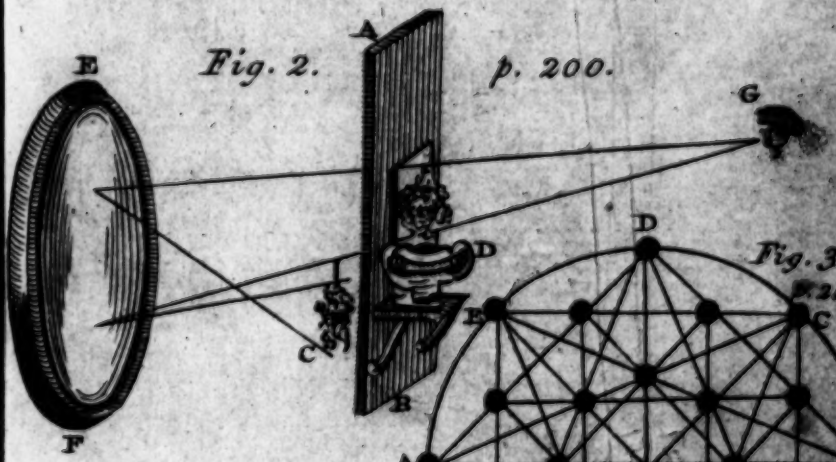


Fig. 1. p. 198.

Fig. 2. p. 200.



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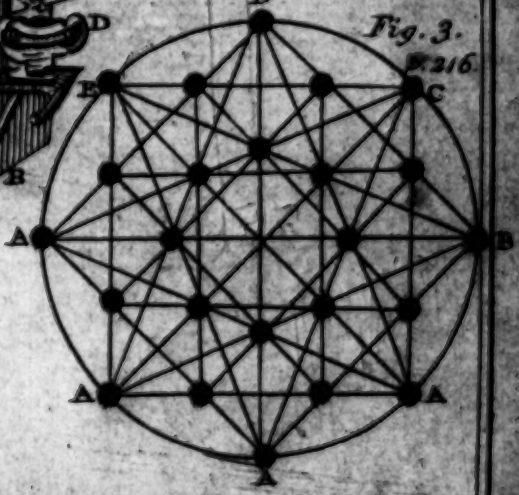
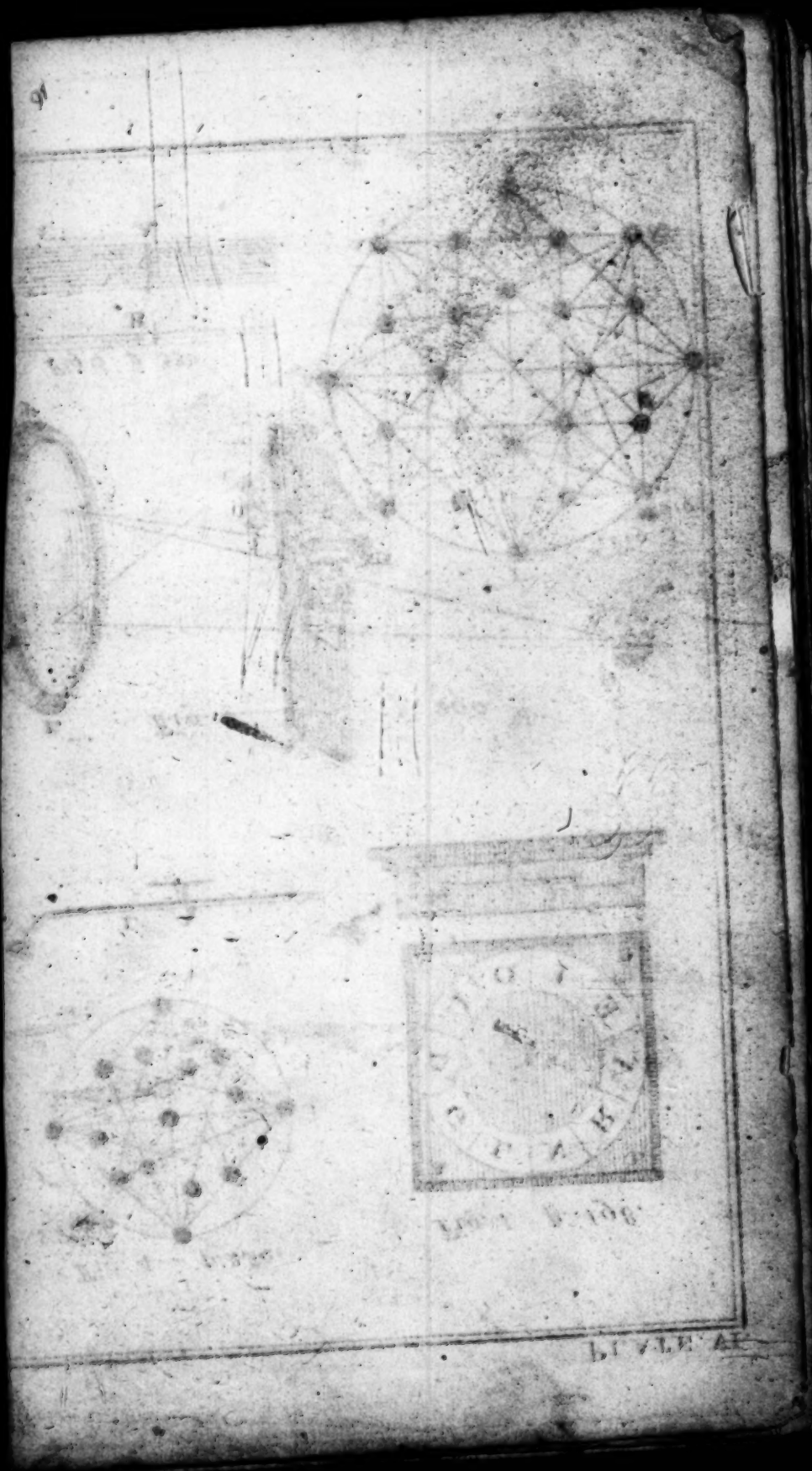
Fig. 5. p. 330.